

Frigidaire Names 365 Members To 1934 B. T. U. Quota Club

DAYTON—Three hundred sixty-five more Frigidaire salesmen, supervisors, and dealers have attained their 1934 quotas and have been awarded membership in the 1934 B.T.U. Quota club, Frank R. Pierce, sales manager of Frigidaire Corp., announced Nov. 27.

Competition among members is now under way to determine successful candidates for national offices in the club. High man from the high district, based on percentage of quota secured, automatically becomes president, according to Mr. Pierce, with the high man of the second top district selected as vice president. The cabinet is made up of the high men from the next five districts and the B.T.U. Congress from a minimum of three top men from each district.

New Members of Club

The newly qualified members are:

Akron district: L. C. Schrecker, Youngstown, O.

Atlanta district: George E. O'Neal and S. E. Brown, Asheville, N. C.

Chattanooga district: J. M. Gordon and C. C. Myers, Nashville, Tenn.

Dayton district: Griffin Electric Co., W. H. Griffin, and Amos L. Whittaker, Owensboro, Ky.; Demarre & Co., Bardonia, Ky.; Page Bros. Motor Co., Russellville, Ky.; Schwegman & Roedel, Pomeroy, O.; Freeman Furniture Co., Danville, Ky.; John E. Williams and Frank Bookmeyer, Ft. Wayne, Ind.; Hobart Walker Co., Ashland, Ky.; E. H. Kehr, H. M. Lawson, and Advanced Refrigeration Co., Portsmouth, O.; A. M. DeHart, Norwood, O.; R. L. Johnston, Aurora, Ind.; Holland Electric Co., and Dwight Holland, Newark, O.; Mid-State Co., Madisonville, Ky.; Ross & Shaney, Troy, O.; N. J. Stork, C. E. Hunley, H. K. Spake, Robert Wentzel, William Setzer, Joe Herold, S. J. Wulkan, W. S. Neff, F. C. Vail, Refrigeration Equipment Co., Don B. Brown, K. D. Kothkiss, and Walter Furrey, Dayton; T. S. Pieratt, Fair Store, J. G. Harlow, J. Graham, Harry Goehring, Cincinnati; Tennessee Power & Light Co., Springfield, Tenn.

Fort Worth district: Ray Hill and West Texas Utilities Co. District C, Stamford, Tex.; Ford Radio Shop, Dallas; Bert Curry Refrigeration Co., Tampa, Fla.; West Texas Utilities Co., Abilene, Tex.; West Texas Utilities Co. District H, McCamey, Tex.;

T. E. Kuhkendall and T. A. Shahan, Abilene, Tex.; Office Cloninger, Vernon, Tex.; Household Supply Co., Lubbock, Tex.; Mayer & Schmidt, Tyler, Tex.; Midland Hardware Co., Midland, Tex.; F. E. Martin, Ft. Worth, Tex.; Lon Woodson, San Angelo, Tex.; Carl Lamb, George C. Spann, and S. A. Dupriest, Childress, Tex.; W. L. Crouch, McCamey, Tex.; M. L. Taylor, and E. D. Day, Ballinger, Tex.

Houston district: R. E. Cox, Houston.

Indianapolis district: D. W. Ashford, Evansville, Ind.; Harry P. Benbow, Anderson, Ind.; Belmont Electric & Radio Corp., and J. E. Byers, Indianapolis; Roy B. Tope, Connersville, Ind.; Horace Link & Co., Brazil, Ind.

Los Angeles district: Earl Meech, Albert F. Niethamer, James Morrow, G. L. Buckboro, and Paul A. DuPont, San Diego; William J. Schworer, and W. N. Brown, Alhambra, Calif.; Frank S. James, Pasadena; Bert K. Harvey, Huntington Park, Calif.; C. P. McGregor, Los Angeles.

Miami district: William O. Tuttle, F. B. Hoselton, Miami, Fla.; G. W. Mann, West Palm Beach; F. E. Guber, Ft. Pierce, Fla.; J. Garfunkel, Nassau, Bahamas.

New England district: W. E. Hughes, Williamantic, Conn.; E. J. Larkin, Danielson, Conn.; William L. Doyle, E. Hampton, Conn.; James F. Biggin, Waterbury, Conn.; C. Clifford Bullock, Bristol, Conn.; T. J. Casey, Winsted, Conn.; Burton D. Warnes, and L. C. Janetty, Waterbury, Conn.; Richard L. Gerken, Bennington, Vt.; J. Sidney Powell, and Gullabi, C. McCarthy, Bridgeport, Conn.; Louis B. Divine, Fall River, Mass.; Edward S. Petras, New Milford, Conn.; Donald C. S. Comstock, Thompsonville, Conn.; T. Finan, Ambrose Kenworthy, and A. B. Underhill, Norwalk, Conn.; Eiden L. Barrows, Milford, Mass.; Franklin Sherwood, Roslindale, Mass.; Geo. A. Curtin, G. O. Comstock, Daniel Kelleher, E. J. Carlson, and Grant A. Morrill, Worcester, Mass.; H. M. Hickey, and U. S. Grant, Everett, Mass.; Clarence H. Mahl, Hartford; Maurice A. Hannigan, Pittsfield, Mass.; Sidney F. Greeley, H. A. McMahers, Geo. T. Stevens Sons, and Harold W. Atwood, Framingham, Mass.; Thomas A. Stewart, Portland, Conn.; Roy E.

Darroch, New Britain, Conn.; Horace S. Thomas, Portland, Me.; Leon W. Foote, Pittsfield, Mass.; Frank J. Ennis, East Hampton, Conn.; Joseph O. Hull, Norwick, Conn.; Donald Fullington, and John E. Pemberton, Pawtucket, R. I.; R. H. Eastman, Ashland, N. H.; William R. McNally, Joseph M. Silva, Andrew R. Murphy, and Robert H. Phinney, Providence, R. I.; Harold Dempsey, Newport, Vt.; E. G. Cross, Hyannis, Mass.; Adrien LeBlanc, Salem, Mass.; E. L. Roberts, Canaan, Conn.; H. H. Cohan, and R. E. Martin, New Haven, Conn.; Harold L. Carver, Keene, N. H.; W. Spicer Huntley, Niantic, Conn.; Walter Geary, and S. W. Sterling, New Bedford, Mass.; L. C. Fuller, V. E. Lutz, Henry Isaacs, Samuel Garlitz, Edward F. Brown, Boston, Mass.; Clarence A. McLay, Meriden, Conn.; W. J. Reed, Newport, Vt.; Wilson L. Highmore, New London, Conn.; William List, Fall River, Mass.; R. V. Howard, Rutland, Vt.; Harry W. Crowell, Hyannis, Mass.; Frederick Bramhall, Haverhill, Mass.; A. S. Flood, St. Johnsbury, Vt.; Ralph R. Spaulding, Burlington, Vt.; W. R. Schult, No. Scituate, Mass.; G. Leslie Blood, L. P. Des Marais, Somersworth, N. Y.

Quota Breakers in New Orleans

New Orleans district: Jack Gullory, Montgomery, Ala.; John G. Luyben, Cullman, Ala.; A. B. Russell, Brewton, Ala.; Carl Woodall, Huntsville, Ala.; L. C. Landry, Crowley, La.; B. W. Eddy, Birmingham; H. B. Millett, Norco, La.

North Central wholesale district: R. C. Busher, J. A. Wing, Don Noland, J. F. McDermott, and Lee Homebrook, Decatur, Ill.; Louis J. Solar, Jr., Straders' Inc., and R. R. Miller, Chicago; A. F. Rochelt, LaCrosse, Wis.; A. W. Glawe, Inc., and V. M. Larson, Wauwatosa, Wis.; E. A. Kiloren, Appleton, Wis.; O. L. Gilmore, Champaign, Ill.; G. M. Robbins, P. R. Hemmerlau, M. Burgess, L. K. Peterson, L. F. McEvoy, and Edward Tank, Milwaukee; Carl Gruetzmaier, West Bend, Wis.; William F. Commerford, Waukegan, Ill.; William F. Carity, Oshkosh, Wis.

Oakland district: Race & Landers, Lindsay, Calif.; G. B. Norwood, Sacramento, Calif.; Robert Pyster, Oakland, Calif.; F. A. Rupley, and C. Wier, Auburn, Calif.; D. C. Poulsen, Santa Rosa, Calif.

Oklahoma City district: T. R. Moore, Wewoka, Okla.; M. M. Nicodemus, Virgil Hix, Herbert Roberts, Bob Price, and W. A. White, Ft. Smith, Ark.; W. Fred Thompson, Norman, Okla.; Walter Goyne, Ada, Okla.; R.

H. Webster, Shawnee, Okla.; L. O. Smith, Seminole, Okla.; Ray Martin, Maude, Okla.; W. K. Schmitt, Muskogee, Okla.; E. R. Heiliger, Clinton, Okla.; E. M. Cluck, Sayre, Okla.; L. T. Brington, Pawnee, Okla.; J. C. Ainslie, L. H. Cullen, H. B. Stevenson, and E. Delaney, Oklahoma City; E. B. Peters, Duncan, Okla.

Philadelphia district: R. B. White, Ashley, Pa.; Roy Stauffer, Pittston, Pa.; John Shenk, Jr., Penbrooke, Pa.; M. L. Hastings, Delmar, Del.; R. W. Fisher, and H. Cadwalder, Jr., Trenton, N. J.; J. D. Helt, Lykens, Pa.; J. Evans, Wilmington, Del.; Harry Wagner, Clinton, N. J.; J. A. Waltersdorf, Hanover, Pa.; William H. Lamborn, Avondale, Pa.; W. M. Knauss, F. K. Doll, and George De Long, Allentown, Pa.; R. A. Miller, Philadelphia; F. H. Stortz, Emmaus, Pa.; J. Schneider, D. S. Frey, H. J. Miller, and R. Bittner, Philadelphia; C. Acton, Bridgeton, N. J.; J. C. Glou, Scranton, Pa.; William Ream, Harrisburg, Pa.; J. L. Hosler, Hershey, Pa.; A. A. Costenbader, Palmerton, Pa.; E. O. Evans, Wilkes-Barre, Pa.; Charles Young, Reading, Pa.; H. E. Minnich, Bloomsburg, Pa.

Pittsburgh district: C. V. Long, N. Makrauer, G. B. Dickenson, W. S. Dingfelder, Jack Reynolds, A. Hermansdorfer, M. M. Roth, F. C. Devlin, W. T. Poerl, and F. A. DeSimone, Pittsburgh; F. L. Anderson, Unity, Pa.; B. A. Bender, Russell Benden, and D. Donofsky, Carrolltown, Pa.; C. O. Campbell, and Steve Ross, Johnstown, Pa.; L. R. Beck, Brookville, Pa.; R. A. Bolon, Barnesville, O.; I. E. Gordon, Beaver Falls, Pa.; M. J. Robinson, Morgantown, Pa.; E. H. Taylor, and J. W. Tylor, Parkersburg, W. Va.; D. F. Nichols, Clarksburg, W. Va.; N. M. Jackson, Clarksburg, W. Va.; H. W. Casteel, Morgantown, W. Va.; J. W. Tylor, Parkersburg, W. Va.; J. S. Killian, R. R. Curry, R. F. Pabst, J. C. McFadden, R. L. Hoffman, W. G. Keener, and T. E. Faust, Fairmont, W. Va.; Phillip Goodman, Butler, Pa.; W. P. Purks, New Kensington, Pa.; W. G. O'Donnell, Emporium, Pa.; V. V. Lewis, and H. A. Waddell, Opolo, Pa.; A. E. Kenneweg, and C. L. Stottler, McDonald, Pa.; A. W. Riffe, R. S. Rewlbridge, R. H. Weller, B. F. Morrissey, Charlestown, Pa.; Charles Sargeant, and R. E. Maxwell, Brownsville, Pa.; B. R. Hoon, Uniontown, Pa.; C. E. Brasuell, and C. R. Mitchell, Ridgeway, Pa.; J. T. Littler, Butler, Pa.; T. I. George, New Kensington, Pa.; M. L. Bouch, Vandergrift, Pa.; T. V. Grady, Kittanning, Pa.; E. B. Lauderbaugh, Clarion, Pa.; H. E. Gregory, New Kensington, Pa.; C. W. Moore, and W. S.

McVaugh, Washington, Pa.; E. H. Lightner, and J. H. Muellen, Canonsburg, Pa.; R. H. Croushore, Monongahela, Pa.; Thomas Clister, Latrobe, Pa.; J. O. Nichols, J. J. Cameron, A. E. Frederick, and Elton Brown, Greensburg, Pa.; Charles Prehoda, Beaver Falls, Pa.

Roanoke district: W. W. Lewis, High Point, N. C.; C. E. Beeler, R. D. Thrush, and G. C. Reed, Charleston, W. Va.; Ella H. Lloyd, Montgomery, W. Va.; D. E. Payne, Dunbar, W. Va.; M. D. Egerton, and E. W. Gamble, Greensboro, N. C.; R. C. Kunkel, Pulaski, Va.; George R. Cowan, Elizabethton, Tenn.; F. C. Blockside, Chapel Hill, N. C.; Jasper H. Wilson, Bristol, Tenn.; A. E. Crawford, Erwin, Tenn.; I. N. Fuqua, and C. M. Corling, Bluefield, W. Va.; D. T. Bray, and A. R. Parker, Jr., Danville, Va.; A. H. Sanborn, Fayetteville, N. C.; E. Guy Graves, Beckley, W. Va.

San Antonio district: A. D. Martin, Temple, Tex.; Hill Caldwell, and C. A. Blowbaum, Austin, Tex.; W. D. Whalen, Alamo, Tex.; E. L. Stevens, Yoakum, Tex.

St. Louis District Members

St. Louis district: Stix, Baer & Fuller, J. L. Browne, E. H. Koch, J. Brangenberg, A. L. Rape, J. P. Hart, and N. J. Gordon, St. Louis; Radio Electric Co., Macon, Mo.; Wayne C. McCormick, Herrin, Ill.; F. Voelker, St. Louis, Mo.; E. H. Browne, E. St. Louis, Ill.; J. W. Dye, and Mrs. Ida S. Henn, Hannibal, Mo.; Walter Biehle, Perryville, Mo.

Seattle district: C. H. Messer, Seattle; J. R. Daigleish, Yakima, Wash.

Tampa district: E. M. Blass, and D. R. Ellerbe, Orlando, Fla.

Twin Cities district: Ottertall Power Co., Rugby, N. D.; Johnston Bros., and A. E. Schwarz, Minneapolis; Montana Dakota Power Co., Miles City, Mont.; Montana Dakota Power Co., Williston, N. D.; Montana Dakota Power Co., Glendive, Mont.; West End Plumbing & Heating Co., and Grand Furniture Co., St. Paul, Minn.; Raymond J. Hintgen, Wahpeton, N. D.

Wichita district: J. C. Simonet, Wichita, Kans.; Ralph D. Rodkey, Harry K. Powell, and Empire District Electric Co., Joplin, Mo.; L. L. Plunkett, Webb City, Mo.; O. L. Markham, Baxter Springs, Kans.; McPherson Electric Co., McPherson, Kans.; C. F. Haverfield, Pittsburgh, Kans.; D. A. Friesen, D. T. Meek, and Freeman Equipment Co., Enid, Okla.; Jack Doerr, Larned, Kans.; J. D. Cochran, Aurora, Mo.; J. F. Boyersmith, Hutchinson, Kans.; V. M. Nichols, Wellington, Kans.

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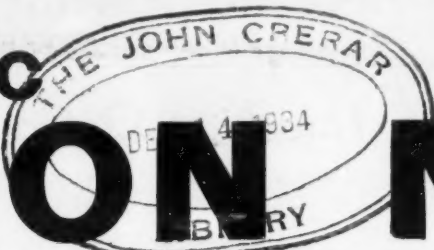
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Utilities Change Policy on TVA 'Interim' Models

Georgia & Tennessee Firms Discontinue Sale At \$79 Price

ATLANTA—Georgia Power Co. has announced via newspaper advertising that the TVA model (interim) Kelvinator will jump in price from \$79.75 to \$99.50 on Jan. 1. Late in November, the utility had in the neighborhood of 2,000 of these refrigerators in its warehouse.

Significance of this announcement is that until Jan. 1 when the price increases, this particular refrigerator may be sold as a TVA model on TVA terms, which call for a down payment of \$3.75 and the balance at the rate of \$2.54 per month. Georgia Power salesmen have been informed that some doubt exists as to whether the manufacturer will make available further supplies of this model.

Tennessee Power Co. to Boost Price Jan. 15

CHATTANOOGA, Tenn.—All refrigeration dealers in the territory served by the Tennessee Electric Power Co., which covers a major part of the state, have been informed by E. W. Ashmead, the utility's manager of sales, that on Jan. 15, 1935, the company will discontinue sale of 4-cu. ft. interim-model Frigidaires at the present price of \$79.50. This refrigerator has been selling since last spring under the TVA label.

In his statement to dealers, Mr. Ashmead said, "In the event there should be any of these units remaining in our stock on Jan. 15, they will be withdrawn from sale at the old price and arrangements made either to replace them in line with the new 1935 models, or they will be exchanged for new models."

"This policy will, we feel sure, be of benefit to you, as it will allow dealers, as well as ourselves, to begin 1935 activities on a comparable basis. We wish to take this opportunity to assure you again of our earnest desire to cooperate with you, and assist you in every way possible in promoting sale of electric appliances in our territory."

Copeland, Zerozone & Mayflower Moved

DETROIT—Copeland, Zerozone, and Mayflower manufacturing and sales operations are now being conducted at the plant at Holden and Lincoln Aves. here recently purchased by Dallas E. Winslow, Inc., parent corporation of the three refrigeration manufacturing concerns, according to Mr. Winslow.

Evacuation of the plant at Mt. Clemens, Mich., formerly occupied by Copeland and Zerozone was completed last week, company officials announced.

There are more than 200,000 sq. ft. of floor space in the plant at Holden and Lincoln Aves. here, as compared with 130,000 sq. ft. of floor space at the former Copeland plant in Mt. Clemens.

Distributors to See New Grunow Line Next Week

CHICAGO—Distributors of Grunow electric refrigerators will get a "pre-view" of the 1935 Grunow refrigerator line at the distributors convention of General Household Utilities Co. to be held next Monday and Tuesday, Dec. 17 and 18, according to H. C. Bonfig, vice president and sales manager.

Meetings will open early Monday morning in the Lake Shore Athletic Club here, Mr. Bonfig announced.

200 Electrolux Men Meet in Evansville

NEW YORK CITY — With New York headquarters officials and sales representatives from all sections of the country aboard, special cars attached to the "St. Louisan" left the Pennsylvania Station here Sunday night for Evansville, Ind., where the "1935 Sales and Advertising Conference" of Electrolux refrigerator sales division of Servel, Inc., is being held this week.

The theme of the conference will be a recent declaration made by Axel L. Wenner-Gren, chairman of the board of Servel, Inc., before the Advertising Club here, that he believes the United States is ready for a selling drive, according to F. E. Sellman, vice president in charge of advertising, sales and promotion of the Electrolux division of Servel, Inc.

Mr. Sellman said that more than

Our Error!

Story on Freon Price in Error Due to Lost Line

On the front page of the Dec. 5 issue of ELECTRIC REFRIGERATION NEWS the following news item appeared:

WILMINGTON, Del.—Kinetic Chemicals, Inc., of this city has reduced the price of Freon to refrigeration manufacturers with which it is contracted for 1935, according to W. W. Rhodes, sales manager. The reduction will permit the manufacturers to quote their distributors and dealers a price of 10 cents per lb. out of warehouses.

The last sentence should have read: The reduction will permit the manufacturers to quote their distributors and dealers a price of 10 cents per lb. out of warehouses, less than the prices which prevailed in 1934.

In other words the price of Freon will be reduced 10 cents per pound.

175 Norge Distributors Meet in Detroit

DETROIT—Norge distributors and their associates—175 in all—are assembled here for their annual meeting with executives of Norge Corp. At the Players' Playhouse they are seeing new products and hearing the '35 sales program. Report on their meeting will appear in the next issue of ELECTRIC REFRIGERATION NEWS.

Commercial Refrigeration Highlight of A.S.R.E. Meeting; Engineers Near Agreement on Codes and Standards

Woolrich Tells Plan to Build Storage Plants On Farms in TVA

NEW YORK CITY—Problems of farm refrigeration were emphasized by Prof. W. R. Woolrich of the University of Tennessee, Knoxville, in his talk before the A.S.R.E. Friday morning on "Refrigeration and Agricultural-Industrial Readjustment in the Tennessee Valley."

In outlining the purposes of the TVA, Prof. Woolrich divided the advancement of civilization into three distinct stages.

First is the period of race childhood in which the individual is very inefficient in the use of natural resources. Example: This country during the time of the American Indians.

Second is the period when tools of production, training, and development technique are resources called into play; sometimes, according to Prof. Woolrich, with such challenge to human minds that they develop a high degree of ego and a superiority complex which brings chaos and confusion.

Third of Prof. Woolrich's stages is one based on social-religious standards, and on which we are now entering, he inferred. Civilization approaches the highest form of its development when it recognizes that this third resource is the governing factor in the advancement of mankind, he declared.

Decentralization of industry is one of the important aspects of this new stage, the professor believes. "The eastern area of the Tennessee valley was the demonstration ground of the first major reaction toward decentralization," he said.

Refrigeration is destined to be one of the most important factors in the

Liquid-Zahm Beer Cooler Developed

CHICAGO—Liquid Carbonic Corp. announces a new mechanically refrigerated Liquid-Zahm beer cooler with a Frigidaire compressor specially designed for use with the beer-dispensing system.

According to Liquid Carbonic officials, the new cooler was designed to overcome one of the principal problems of adapting electric refrigeration to beer cooling, namely that beer brought to a lower temperature than the recognized point for proper serving became spoiled and unpalatable.

"Furthermore, it could not be restored to its correct taste or proper body by raising the temperature, and thus beer chilled to a low temperature was irretrievably lost," they state.

"The problem was not one of obtaining the proper cold temperature, but of preventing beer which remained in the Liquid-Zahm tank

Timmerman Reports Progress on Codes For Small Machines

NEW YORK CITY—W. M. Timmerman of General Electric Co. told A.S.R.E. members here last week that committees working on the formulation of standards and codes for small refrigerating machines are now in fairly close agreement, and that the industry can expect the acceptance of these standards in the near future. Mr. Timmerman is a member of the technical committee of the Refrigeration Division of Nema, which has been studying the project for about three years. Title of his talk was "Standards and Codes for Small Refrigerating Machines."

Various individual manufacturers and testing laboratories have already worked up procedures which they have been using for some time, he said.

"They are hesitant to discard these methods under which they have accumulated a mass of data, in favor of new ones. Point by point these differences must be settled until a satisfaction

(Concluded on Page 6, Column 1)

Steining Describes Refrigerant Control

NEW YORK CITY — Frank H. Steining, assistant professor of mechanical engineering at the University of Pittsburgh, described a new refrigerant control device which he has developed for use with the Majestic electric refrigerator, and which may have possibilities for other hermetic machines in which the compressor dome is subject to high-pressure gas.

There is a tendency, Mr. Steining explained, for condensation to occur on the dome of hermetic compressors in which the high-pressure gas is imposed on the dome. When this condensation drains to the oil sump generally provided in the base of the compressor, the refrigerant may be forced into bearing surfaces instead of oil, causing poor lubrication, loss of efficiency, noisy operation, etc.

"Various methods have been used in an effort to eliminate condensation in the dome," the speaker said. "One design placed an electric heating element in the base of the compressor assembly, encased and submerged below the oil sump."

The speaker doesn't favor this arrangement because it reduces the overall operating efficiency of the unit.

Another design places an insulated

Fedders' Cincinnati Branch Enlarged

CINCINNATI — Fedders Mfg. Co.'s branch in Cincinnati has been moved to new and larger quarters at 303 E. Sixth St. Frank Haag is manager.

Life Memberships Given Charter Members Of Society

By John T. Schaefer

NEW YORK CITY—Investigations and new progress in refrigeration of foods, heat transfer studies, standards and codes for small refrigerating machines, the TVA, liquid refrigerant controls, and other technical problems ran the gamut of technical inquiry by refrigerating engineers here last week in the 30th annual winter meeting of the American Society of Refrigerating Engineers, Wednesday, Thursday, and Friday at the Hotel New Yorker.

Air conditioning, which has been given quite a prominent place in several A.S.R.E. conventions of the past few years, was conspicuously absent from the program this year, although some of the fundamental theory presented at the meeting was intended largely for use in solving air-conditioning problems.

With the conclusion of last week's meeting, Harry Harrison of Carrier Engineering Corp. became president of the society, succeeding A. R. Stevenson, Jr., of General Electric Co. Samuel C. Bloom, consulting engineer of Chicago automatically became first vice president, while the newly elected second vice president is Harry M. Williams, research engineer of Frigidaire Corp.

Celebrating the 30th anniversary of the founding of the society, a special program honoring charter members was carried out at the Thursday night banquet. This included the presentation of life memberships to all living charter members, and the production of a highly amusing one-act playlet, "Ah, Frozen Wilderness" written by D. L. Fiske, editor, and Miss Helen Peffer, managing editor of Refrigerating Engineering.

Of the 70 men who aided in organization of the society as charter

Refrigeration Division Of Nema Meets

DETROIT, Dec. 11—Refrigeration Division of National Electrical Manufacturers' Association met here today with association business constituting the principal subject of discussion.

Member companies were represented at the meeting as follows:

Apex Electrical & Mfg. Co., R. G. Strittmatter; Crosley Radio Corp., Lewis Crosley; Frigidaire Corp., W. F. Armstrong; Kelvinator Corp., George W. Mason and H. W. Burritt; Merchant & Evans Co., Thomas Evans; Norge Corp., Howard E. Blood and H. H. Whittingham; Servel, Inc., Harry Newcomb; Stewart-Warner Corp., Charles R. D'Olive; Sunbeam Electric Mfg. Co., J. H. Schroeder; Universal Cooler Corp., G. M. Johnston; Westinghouse Electric & Mfg. Co., R. E. Imhoff and P. Y. Danley.

Refrigerating Engineers Hold Informal Discussions after Convention Hours



A popular member at all A.S.R.E. meetings: George Bright, consulting engineer.

Russell Ayres (left), G-E engineer, clears up a difficult technical point for Carl Conkey of New York City.

Harry Edwards of Union Carbide & Carbon Corp. (left) chats with George Bright—probably about safety codes.

Irv Knudson of Detroit Lubricator Co. discusses expansion valves with Russell Ayres of G-E.

Dick Townsend (facing camera), who knows all the places in New York, helps to plan an evening.

Woodcox Forecasts Record Xmas Sales

DETROIT—A prediction that the Christmas holiday sales volume on electric refrigerators will surpass previous records was made last week by Vance C. Woodcox, director of advertising and sales promotion for Kelvinator Corp.

"Kelvinator shipments to customers during November were 75 per cent ahead of those for the same months of 1933, showing a definite increase in holiday buying," Mr. Woodcox said.

"The combination of an increase in public spending, availability of money and growing confidence in the business future of the nation, are certain to be reflected in business volume by retail merchants during the present Christmas buying season."

Distributor Conducts Vocational School

ROANOKE, Va. — A refrigeration school inaugurated and conducted by Thurman & Boone, Kelvinator distributor here, is providing vocational training for crippled youths from all parts of Virginia.

Project is said to be the only one of its kind in the country. Classes are held daily at the headquarters of Pugh & Whitescarver, Kelvinator dealer. W. M. Wolfenden, Thurman & Boone sales manager, is in charge of the undertaking, while J. L. Pugh and C. K. Whitescarver serve as other members of the faculty.

Opportunity to learn every phase of refrigeration service is given the students. Each man who completes the course is presented with a service kit containing \$20 worth of tools purchased with emergency relief and vocational service funds.

One of Virginia's former governors, E. Lee Trenkle, now chairman of the Virginia State Board of Education, brought members of his staff to Roanoke to inspect the project recently.

Electrol Introduces Low-Priced Burner

CLIFTON, N. J.—Just introduced by Electrol, Inc., is a low-priced, straight-shot pressure atomizing oil burner for small homes.

Built for homes of up to 800 sq. ft. of steam radiation, this burner has a maximum capacity of 1.75 gal. of No. 3 oil per hour.

Thrashing Out a Code Question in Washington



(1) Haldeman Finnie (extreme left), manager of the Refrigeration Division of Nema, and J. K. Knighton and F. N. Pattison, Kelvinator, attend a code hearing. (2) E. J. Murphy, assistant deputy NRA administrator in charge of the Refrigerating Machinery Industry code, scratches his chin while listening to Mr. Finnie's proposal.

G-E Reduces Carrying Charges on Small Appliances

SCHENECTADY—A reduction in carrying charges on budget plan purchases of General Electric appliances amounting to \$100 and less has been announced by G. F. Mosher, president of the General Electric Contracts Corp.

These reductions benefit purchasers of smaller sizes of refrigerators, home laundry equipment, radios, vacuum cleaners, and other G-E appliances.

The announcement comes at the end of the second year of operation of the General Electric Contracts Corp., which was organized by the General Electric Co. to finance time payment sales of company products.

28,000 Units Are Sold in St. Louis in 9 Months

ST. LOUIS—Total of 28,000 electric refrigerators was sold by dealers in this territory during the first nine months of 1934, according to a report issued by the Electric Refrigeration Bureau of St. Louis.

'Featuring the Features' Aids Crosley Sales in May-Stern Stores

CINCINNATI—May-Stern & Co., big furniture store in this city, is rounding out its sixth year in refrigeration selling, year in which it has broken all its previous sales records by heavy use of advertising and a merchandising policy in which the "featuring of features" is of first importance, say officials. For three years the store has sold Crosley.

"Regardless of what the merchandise is," says Martin Mandelker, general manager, "any particular item with new features will appeal to the customer. We simply applied our knowledge of this fact to refrigeration, and made Shelvador features the keynote of our advertising and sales presentations on Crosley."

The store is a consistent user of large newspaper space, and in addition makes at least 12 direct-mailings each year, not less than one per month. Regardless of what product is keynoted in each mailing, a Crosley piece is inserted.

"We have found it pays to cultivate the accounts we already have," comments the general manager, "so our mailings go to what we term our 'Honor Roll customers'—those who

have accounts with us and have paid them as agreed—and to our best open accounts."

As to display, Refrigeration Manager Herbert Frank says, "All last summer we devoted an entire half of our first floor to refrigerator display, and it is our opinion that that was partially responsible for our good sales record. Right now, however, a part of that space is given to radio."

Displays Throughout Store

"We used an entire double window for refrigeration display all summer, and had spot displays throughout the store. This spotting we have continued even during cold weather. A number of sales result from customers seeing a refrigerator while they are purchasing other merchandise."

"All this is backed up with special refrigerator solicitations by all salespeople in our store. No matter what merchandise is being sold by a salesman, he invariably suggests a refrigerator before writing up an order."

"We do not favor the meter sales plan," asserts Mr. Frank. "We have tried it, and feel that it is an unnecessary inconvenience for the purchaser. By handling our own financing, we can arrange satisfactory terms without forcing a customer to drop a quarter every 40 hours to have refrigeration. Too, our rates are lower than those of outside agencies."

"Some prospects believe the meter is an aid to systematic saving. To such persons we offer a small savings bank, but have never found it necessary to use one after the customer has considered the weekly or monthly payment plan."

No Trial Installations

"Our store believes installation of refrigerators on trial is absolutely worthless. While we have never worked it ourselves, we find through others that it stimulates business for somebody else, and creates a demand among salesmen for high pressure methods that are unethical and cause an unfavorable reaction on the store's good name," declared Mr. Frank.

Asked about outside salesmen, he says, "They are an absolute necessity, I believe, under proper circumstances. During the refrigerator season especially they are needed to follow up contacts made at the store and to contact prospects recommended by satisfied users. I do not recommend outside salesmen, however, for canvassing and bothering the public generally."

"As to alternate floor selling and outside selling, we feel that a live wire man accustomed to outside selling is no good on the floor. If he does try floor selling he loses the perspective necessary in a good outside salesman and you lose a good outside man while possibly not creating a good floor salesman. We separate these two branches of our work."

WLW Features Crosley on 43 Programs Weekly

CINCINNATI—Over its own WLW, 500,000-watt station, Crosley Radio Corp. of this city is now broadcasting a weekly total of 43 programs in which Crosley products are featured. These do not include numerous "spot" announcements. None of the programs occur on Sunday.

All but an approximate half-dozen of the broadcasts are made during the morning and afternoon hours. Thirty programs feature Crosley radios, seven promote battery sets, two are devoted to Crosley tubes, one features Shelvador refrigerators, and another features both refrigeration and radio. Crosley Roamio sets have one broadcast weekly, as does the company's current junior-salesman contest.

G-E Names Heads Of Radio Dept.

SCHENECTADY—Following announcement by C. E. Wilson, vice president of the General Electric Co., that G-E radio sets will be manufactured at Bridgeport, Conn. beginning with the line to be introduced in the late summer of 1935, comes the announcement of executives who will direct the new manufacturing and merchandising program.

J. A. Proctor will be assistant to the vice president, with the responsibility of acting for him in general coordination of radio engineering, manufacturing and sales activities.

Designing engineer in charge of the radio engineering section will be I. J. Kaar, who went to Bridgeport from G-E's general laboratory in Schenectady where he did much work in vacuum tube and radio circuit design.

Superintendent of radio manufacture will be R. J. Jenkins, newcomer to General Electric. R. J. Cordiner, formerly manager of the heating-device sales section at Bridgeport, has been appointed assistant manager of appliance sales, in general charge of sales development for G-E radio.

B. C. Bowe will continue as manager of sales in the radio section, a position he has held since the section was established in 1930.

General administration of the radio department will be in the hands of a radio management committee, with R. J. Cordiner as chairman and Messrs. Jenkins and Kaar as the other members. Mr. Proctor will also be a member of this committee, ex officio.

Knight Manages Detroit Branch of Lipman

DETROIT—M. W. Knight, for several years commercial sales manager in the Chicago branch office of Servel, Inc., has been appointed manager of the Detroit branch of the General Refrigeration Sales Co., manufacturer of Lipman equipment. The branch is located at 629 W. Larned St.

Prior to joining Servel, Mr. Knight spent two years in Denver as a Copeland distributor, then came to Detroit as supervisor of Copeland dealers in this territory. Later he was transferred to Copeland's Chicago office, where he also supervised dealer operations.

Seeger Modernizes Chicago Market

CHICAGO—Local sales branch of the Seeger Refrigerator Co. has modernized the Economy market, operated at 3305 W. North Ave. here by Ed. Goranson.

Equipment installed under the direction of L. C. Keely, Chicago branch manager, includes 40 ft. of display case (two meat counters, one double-shelf cold meat counter, one triple-shelf dairy case), mirrored back wall and marble slab wrapping counter.

Seeger coils were built into the cases and the refrigeration for all equipment was furnished by Frigidaire commercial condensing units.

McKee Ice Refrigerator Features Duo-Draft

COBLESKILL, N. Y.—McKee Refrigerator Co., manufacturer of household ice refrigerators, is planning a national sales drive early next year featuring the food preserving features of its new "Evercold Duo-Draft" system of cooling, which is claimed to provide proper relative humidity for foodstuffs.

A promotional program calling for national advertising, a "prospector hunt" which combines a survey and distribution of literature by the Western Union organization, a finance system for time sales, and Visomatic talking slide-films for sales training, has been outlined by Frank H. Ryder, president of the company.

The Visomatic talking slide-film production, which shows 130 photographs synchronized with voices on an electrical transcription disc, makes a 30-minute presentation of the advantages of ice refrigeration and of the new Evercold Duo-Draft system.

Crosley Introduces Two Battery Sets

CINCINNATI—Two new battery American-and-foreign receivers are being introduced by the Crosley Radio Corp., shipments of the new models having begun last week. Chassis for these receivers is an eight-tube super-heterodyne, and covers the standard broadcasts from 540 to 1,700 kilocycles and the foreign broadcasts from 5,800 to 15,350 kilocycles.

The Battery Eight A.F. table model has the same cabinet as that used in the Crosley 72 American-foreign receivers, and lists at \$59.95. The Battery Eight A.F. lowboy lists at \$74.50.

STABILITY

Financial stability of the manufacturer is a prime essential supporting a distributor franchise. The distributor must place his confidence in merchandise produced by the manufacturer who is financially and morally responsible if his hopes for profit are to be realized.

A franchise is as good as the firm backing it. Manufacturers always check the standing of prospective distributors. The distributor should exercise a like privilege because he is vitally concerned as to the reputation, skill and financial resources of the manufacturer with whom he makes an alliance.

For this reason we cordially invite distributors seeking a profitable connection to thoroughly investigate the financial standing of Copeland Refrigeration Corporation and its parent corporation, Dallas E. Winslow, Inc.

Contracts are being written NOW for 1935. There are a few points still open for the right type of representation.

COPELAND REFRIGERATION CORP., DETROIT, MICH.

Manufacturers of Household and Commercial Refrigeration

Main Office and Factory: Holden and Lincoln Aves.

Division of DALLAS E. WINSLOW, INCORPORATED

Copeland

DEPENDABLE ELECTRIC REFRIGERATION

There's a *Rumor* going 'round



★ There's a rumor going 'round that Frigidaire is about to make an announcement of vital importance to shrewd refrigeration dealers. ● *The rumor is true.* ● Frigidaire's Sales Plans for 1935 are almost ready. They embody all the principles that have proved sound in the past—and many new ideas as well. ● If *you* want to stay on the "profit" side of the ledger by swinging along with the leader—now is the time to start. ● A letter will bring you advance information. Write to Frigidaire Corporation, Subsidiary of General Motors Corporation, Dayton, Ohio.

Frigidaire

PRODUCT OF GENERAL MOTORS

THE WORLD'S MOST POPULAR ELECTRIC REFRIGERATOR

PERSONALITIES

By George F. Taubeneck

Jack Schaefer's Issue

This is the JACK SCHAEFER issue of *ELECTRIC REFRIGERATION NEWS*. And it's something we don't want you to pass up with a yawn and a frown and a "Shucks, that's just a bunch of technical dope that nobody can make heads nor tails out of, and that would interest only those nuts over in the engineering department."

What we maintain is that this "technical dope" is interesting as the engineering editor of this paper writes it, and that it won't hurt any distributor, dealer, salesman, sales executive, or promotion man to read it.

Jack went down to New York last week to attend the annual midwinter meeting of the American Society of Refrigerating Engineers. These are the boys who design the products that you fellows will be selling next year and the years following. What they are doing and what they are thinking should be of vital interest to you, because the things they thrash out in these meetings eventually crystallize into profit opportunities for selling organizations.

But until Jack Schaefer came along, the American Society of Refrigerating Engineers might just as well have been the American Society of Egyptian Archeologists, as far as most members of the industry were concerned.

The society met semi-annually, heard papers, and had its discussions. Its papers were recorded in the society's archives, and distributed monthly over a period of time in the society's private publication. Practically nobody in the selling end of the refrigeration industry—which comprises at least 80 per cent of the people in the business—had the foggiest notion of what the A.S.R.E. was all about.

When Jack joined *ELECTRIC REFRIGERATION NEWS*, however, he instituted the practice of attending these semi-annual meetings, and digesting in understandable language the papers presented at the sessions all in the next issue of the *NEWS*.

Thus the entire industry has been able to keep up-to-date on progress in the industry's laboratories. By reading Schaefer's reports—and we think he is the most lucid writer on engineering subjects contributing to any business paper today—the distributor in Oskaloosa and the sales promotion man in Pasadena have been able to catch the vision of what engineers are doing for the industry, and have better been able to understand what it is that makes the wheels go 'round inside the products they have been selling.

Jack's most difficult task in this connection has not been the translation of a technical paper into a readable story. That's a talent with which, presumably, he was born. His toughest job was convincing these engineers that he could be trusted with their valuable papers.

Some of them had had experience with newspaper men before. They knew how a highly technical report could be hopelessly and deplorably garbled. Trust a newspaper man with the fruit of their labors and research? Let him ruin their professional reputations by a misinterpretation? I should say not!

But, individual by individual, Jack has persuaded these engineers to let him have their reports for publication in the *NEWS*. And once sold, they stay sold; for Jack not only does not garble their writings, but makes them so clear and understandable that the authors are forever grateful. Frequently one writes in, after the publication of Jack's story, to say that it was the best technical report of an engineering paper or discussion he has ever seen in print.

So-o-o-o-o, we're just tellin' ya. If you fail to read the reports of the A.S.R.E. meeting in this issue, you're

missing out on something really extraordinary.

An Industrial Congress

As per usual, we tagged along with Jack to the meeting, partly to renew old friendships among the engineers (and they're a swell bunch), partly to get our own thinking straight on some things, partly to be of assistance to Jack in case he needed any (he didn't), and partly to see a few people in New York City—among them T. K. QUINN of General Electric and L. Y. McANNEY of Commercial Investment Trust Corp.

But perhaps the most interesting thing we ran into in New York was a big gathering at the always-interesting Waldorf-Astoria hotel at the end of the week. It was called the Congress of American Industry, and its attendance list was almost as full of industrial notables as was the Sloan dinner to American business leaders on the night preceding the opening of the 1934 Century of Progress exposition in Chicago.

This "congress" recommended to the Congress of the United States that only those phases of the NRA which have proved useful to business be given additional life upon the expiration of the National Industrial Recovery Act on June 16, 1935.

Only those industries which desire codes of fair practice should be governed by them, these business leaders agreed, and industries which haven't found codes successfully applicable should not be forced to chafe under their restraints any longer.

Bardo, Emery, Carothers

In addition to the magnificent trappings and surroundings always furnished by the new Waldorf-Astoria, some of the highlights of the gathering were trenchant speeches by C. L. BARDO, president of the National Association of Manufacturers, JAMES A. EMERY, counsel for that body, and Dr. NEIL CAROTHERS of Lehigh University.

Mr. Bardo's speech was the keynote of the meeting.

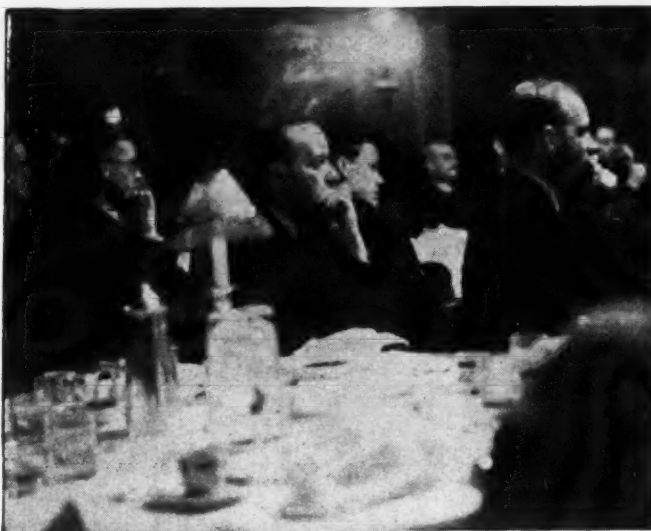
"Industry stands on the threshold of public opinion," he said. "We will be praised or condemned as we measure up to a sound program of industrial recovery, based upon the precepts and experiences of our established economic order, and out of which has developed the greatest and most successful industrial nation in the world."

"That system, through its cooperation with all interests, has raised the standard of living and the well-being and prosperity of its citizens to a level not heretofore enjoyed by the people of any other nation. We will be condemned, and I believe justly so, if the hopes of millions of unemployed and the administration which has extended its desire to aid, are dashed to pieces upon the rocks of individual or group selfishness."

Mr. Bardo said the question before the business men of the country was, what cooperation can be offered and supported which will speed up the natural forces of recovery. "Are we willing to cooperate with each other, with government, labor, and consumer to a common goal of economic recovery?" he asked. "I make bold to say that I think we are and have in the past. Cooperation is clearly contemplated in the platform of industry now before you."

He opposed the 30-hour week, declaring that it was economically unsound and would decrease rather than increase employment.

"We thoroughly approve the President's proposed industrial labor truce," he said. "We urged its extension until such time as the cooperation of government and agriculture may restore farm prices to a fair economic balance with manufactured goods. Any further increase in cost



(1) Members of the Associated Business Papers (Secretary H. J. Payne is in the foreground at the right) listens to (2) Henry Wallace, Secretary of Agriculture, elucidate the ideals of the New Deal.

of manufactured goods before this is established will only prolong the depression."

"Unless supported by complete unity, any plan for economic recovery by industry will fall of its own weight," Mr. Bardo continued.

JAMES A. EMERY, counsel for the association, declared that new expenditures by the national government would increase the pressure for reckless inflation or unendurable taxation.

Mr. Emery declared that the National Labor Relations Board was taking extra-legal power and that "taking its decision as a whole, it has made effective major provisions of the Wagner bill which Congress rejected."

The lawyer expressed the opinion that labor unions should be made as responsible before the law as employers. He favored legislation requiring unions to resort to a fair tribunal before legalizing strikes or lockouts.

"The nature of the controls now established, the confusion and contradiction in administration, the extra-legal penalties enforced, the deadly conflict of overlapping codes with multiplying budgetary assessments, the denial of judicial review of orders affecting substantial rights, all these do not comport with self-government for industry."

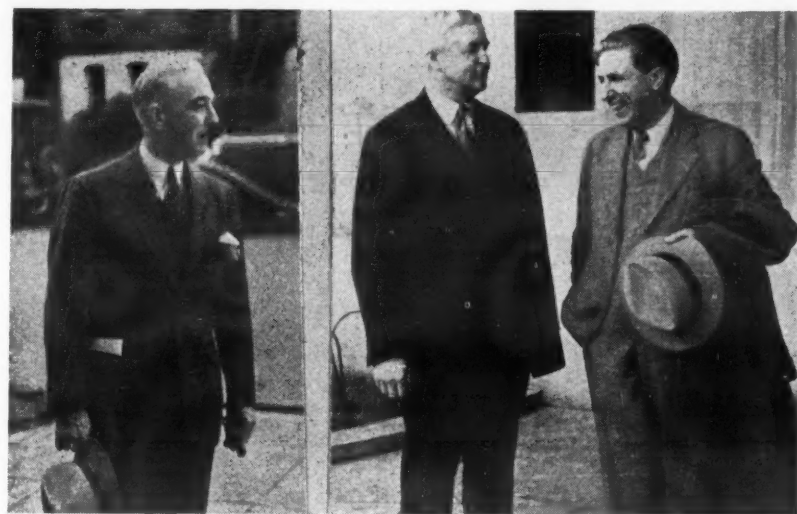
JOHN C. GALL of Washington, associate counsel of the association, who has just returned from a survey of industrial relations in Europe, gave figures on trade unionism in Great Britain. He said there had been a steady decline in membership year by year since 1920, and a particularly noticeable decline since the general strike. In 1920 the membership was 8,346,000 and in 1933 4,383,000, he said. He added that so far as the law was concerned the open shop policy was still the rule in Great Britain.

Dr. NEIL CAROTHERS, director of the College of Business Administration, Lehigh University, delivered a blistering attack on "government playboys" whose "tinkering" was responsible for holding back a business world all set to embark on a great prosperity era.

Recovery is under way all over the world, he said, but lags in the United States. Business has been chastened and purified. Capital is piled high awaiting safe investment. A starved consuming power is hungry to buy goods.

"The whole industrial equipment is set and ready to go," he said, "and this blessed revival is blocked and hindered and retarded by uncertainty and fear, fear of what new experiment will be tried next, fear of some suicidal 30-hour-week, fear of some new government project for taking over the banks, fear of some spending policy that will destroy our solvency. We stand hesitating and shrinking on the very brink of recovery because government playboys continue to tinker with the vital economic processes of America."

"All that this country needs today is an end to experiment and manipulation and regimentation and interference. All that we need for recovery



(1) Major R. B. Lawrence of the Federal Housing Administration. (2) Jesse Jones, chairman of the Reconstruction Finance Corp., and his pal, the Rev. Bill Smith, evangelist and educator from the Ozarks.

is assurance there will be no more attempt at recovery by law. The country is weary of a new plan every morning. It is frightened by this policy of a rabbit-out-of-a-hat every week. We have had recovery by manipulation for a year and a half, and we still have 10,000,000 unemployed and a \$5,000,000,000 deficit."

Fishermen, N.B.:

A new use for electric washers, which though probably of limited market potentialities nevertheless furnishes the basis of one of the wildest "fish stories" of the year, has been brought to the attention of General Electric's merchandise department in Bridgeport, Conn.

It all came about when an appliance salesman, wondering why a relatively small restaurant near Ellenville in lower New York state had purchased six washing machines, decided to call on the proprietor and inquire the reason. He wondered still further when JOE MEDWAY, the restaurateur, informed him that the machines had never cleaned a garment.

Joe, it seems, operated a rather unusual tourist attraction. He had a pond stocked with trout, and permitted passing motorists, for a small fee, to select a fish which captured their fancy, catch it with a net, and then have it cooked and served. The fish, though, having been brought up in sheltered surroundings where there was no battle for existence, were soft and flabby—in short, sissy trout.

Then one day Joe made a discovery. He had gathered a bunch of netting from the water's edge and rinsed it in his electric washer. When he removed the net, he noticed a trout jumping about the interior of the machine with joyous, sprightly, and indeed unwonted, abandon. Thinking this unusual behavior to be merely a passing mood, akin to dizziness, Medway nonchalantly tossed the fish back into its artificial habitat... but was he surprised!

According to the restaurant-keeper, the trout no sooner struck the water than it was off like a flash, up, down, and crosswise, until the placid waters were transformed into a sea of tiny whitecaps and the other trout were scurrying for safety.

Finally, says Joe, the bit of spotted dynamite swirled into shore, came to a spray-raising stop at its owner's feet, and with wiggles and jumps and imploring eyes begged for another try at the invigorating currents induced by the washer's activator mechanism.

"Just a case," Medway told the investigating salesman, "of reverting to type. He was a mountain trout, and his forefathers fought and bled in rushing, roaring streams for their three meals a day. He had it in his blood. He couldn't help it."

The discovery led to a systematic routine of such exercise for all of the trout, and today the six G-E washers are used only as piscatorial gymnasiums. What's more, Joe's business is growing almost daily.

Even in the Arctic

That old gag about some salesman being good enough to sell ice to the Eskimos may not sound so funny after you read this item from the *Detroit News*:

VANCOUVER, B. C., Nov. 30—(U. P.)—Fourteen men aboard the Royal Canadian Mounted Police supply ship, *St. Roch*, arrived here recently after four years above the Arctic circle.

The patrol enforced the King's law in the Arctic. It's only contact was with Eskimos and scattered Mountie outposts. Coronation Gulf was the center of activities.

The deck of the *St. Roch* was laden with dozens of empty fuel drums, testifying to her numerous long voyages.

Sergt. H. A. Larsen, commander, noted a distinct lack of drifting ice last summer.

"We even had difficulty in finding ice for cooling purposes," he said

Kelvinator Men Work at High Speed in Preparation for Big Campaign



A whopping big sales program for 1935 is getting under way out at Kelvinator, and its making the executives work at top speed. (1) C. M. Armstrong of ReDisCo. (2, 3 & 4) Charles Hadden.



**FAIRBANKS-MORSE
ELECTRICAL REFRIGERATOR
with CONSERVADOR**



IT CONQUERED!

First get this picture—! Fifty distributors gathered in a room—fifty distributors who had spent long years in the business, every one of them knowing what it takes to make Mr. and Mrs. American Citizen buy. They waited for the introduction of the new 1935 Fairbanks-Morse Refrigerator with the typical skepticism of their kind.

Five minutes later these fifty distributors were on their feet, applauding. Before the day was over they had taken the F-M franchise and backed their judgment with orders to a

history-making amount.

What did they see?

First of all, a refrigerator almost breath-taking in its beauty. A refrigerator which, point by point, has every feature ever offered by any other—*plus one thing more!* The CONSERVADOR. They called it the greatest improvement in home refrigeration since the invention of the electric refrigerator itself. They saw its instant appeal to housewives everywhere. Greater *convenience* — more

usable storage space — 30% less current consumption!

These distributors, who know refrigerator selling, saw in the Fairbanks-Morse line a profit opportunity of the kind that comes seldom in a lifetime—and they saw the value of the F-M franchise.

Franchises for a few territories are still open for distributors of the right kind only. Full information may be obtained by addressing Fairbanks-Morse Home Appliances, Inc., 430 South Green Street, Chicago, Illinois.

FAIRBANKS-MORSE

Home Appliances, INC.

104 Years of
Quality Products

ENGINEERING

Standards and Codes for Small Machines Nearly Completed

(Concluded from Page 1, Column 3)
factory compromise is reached," he stated in explaining the difficulties of the work.

The three principal projects are:
1. Dimensional rating method — computing the gross volume, net food storage volume and food shelf area of domestic refrigerators.

2. Refrigerator test code—for mechanically operated domestic refrigerators.

3. Standard rating of commercial refrigerating equipment.

Dimensional Rating Method

Nema's technical committee prepared a recommendation for the above which was adopted by members of its Refrigeration Division in May, 1931, and since that time it has been used universally by the industry, Mr. Timmerman said.

Specifications of household electric refrigerators published by ELECTRIC REFRIGERATION NEWS have followed this method of rating cabinets. "The Nema method was recently given the approval of Sectional Committee B-38 and it will no doubt be adopted as an American Standard in due time," he believed.

Refrigerator Test Code

First activity along this line of the second problem, was the formation of Sectional Committee B-38, under the sponsorship of the A.S.R.E., Bureau of Home Economics, and the U. S. Department of Agriculture, operating under the procedure of the American Standards Association, Mr. Timmerman related.

"The committee devoted its first efforts to the preparation of a test code for household refrigerators using ice. A test code was prepared and accepted as American Recommended Practice in 1931.

"In the same year the Nema Technical Committee, under the chairmanship of Harry M. Williams (of Frigidaire), began work on a test code for mechanically operated household refrigerators.

"Committee B-38, under the chairmanship of Charles H. Roe, has also been active in the preparation of a similar test code. During the past year the activities of the two committees have been brought together so that now they are in fairly good agree-

ment," the speaker continued.

He said the present draft of a test code is pretty well settled on these points:

1. Statement of general conditions of test.
2. No load test.
3. Ice making tests with no food load.

There is still so much difference of opinion on the combined food load and ice freezing test that it will probably be omitted for the time being, according to Mr. Timmerman.

It is planned to distinguish between normal duty and heavy duty refrigerators. Heavy duty refrigerators are to be those suitable for operation where the normal July temperature is over 80° F. Tests on the normal duty refrigerators are conducted at a maximum of 100° F. ambient, whereas the tests on the heavy duty refrigerators are conducted at a maximum of 110° F. ambient.

No Load Tests

"The no-load test is most commonly used since it provides a simple and quick means of obtaining a fair picture of the overall performance of a refrigerator. The proposed test code calls for no-load test to be made at ambient temperatures of 70°, 90° and 100° (110° for heavy duty refrigerators).

"At an ambient temperature of 90° F. the temperature control is set to maintain an average cabinet temperature of 43° F. All of the other no-load tests are made with this same setting. The doors are kept closed throughout the no-load test. Cabinet temperatures are recorded with thermocouples. Readings are taken at each ambient temperature to give the average cabinet temperature, average temperature of the food compartment, kilowatt hours per day (24 hr.), and percentage of operating time," Mr. Timmerman stated.

Ice Making Tests

Ice making tests are to be made according to three procedures: first, at an ambient temperature of 100° F. (110° F. for heavy duty refrigerators) with the temperature control in the coldest position; second, at an ambient temperature of 90° F. with the temperature control in the normal position; and third, at an ambient tem-

perature of 60° F. with the temperature control in the normal position.

"The purpose of the final test in the 60° F. ambient is to determine whether or not the refrigerator will make ice at a low room temperature, without freezing the food in the refrigerator. The complete charge of water is frozen in all ice making tests," he said.

Mr. Timmerman pointed out that the household refrigerator test code may eventually include procedures for such miscellaneous tests as "pull-down tests," "cabinet heat loss," and "unit refrigerating capacity and economy." "However, these tests are of primary value to the manufacturer rather than the consumer, and therefore there is no urgent need for standardization. The principal advantage of standardization of these tests would be greater ease in comparing manufacturers' test results," he said.

Commercial Condensing Unit Ratings

Modification of the ton as a unit and the rating conditions has been a subject for active discussion and argument for some time, principally in a committee of the A.S.R.E., under George A. Horne (committee on standards of measurement), the speaker said.

"Another committee took over the revision of standards as they affected commercial condensing units. It is composed of representatives of the A. S. R. E., Nema, and the Refrigerating Machinery Association," he explained.

Mr. Timmerman declared that this joint committee on rating commercial refrigerating equipment has made real progress toward establishing a new basis for condensing units. The proposed method of rating is based on several fundamental considerations, which are:

1. Since condensing units are designed for operation at various suction temperatures, the standard suction temperature for rating purposes should approximate the design or application temperature.

This resolves itself into using several standard suction temperatures. Proposed values are—10° F., 5° F., 20° F. and 40° F.

2. The suction refrigerant vapor entering the compressor should be at a temperature of 65° F.

3. The ambient temperature should be 90° F.

4. The inlet cooling water temperature should be 75° F.

Standard ton conditions were intended primarily as a rating for the compressor only. The proposed rating covers the complete condensing unit including the condenser. Therefore, instead of specifying the condensing temperature as in the standard ton, the proposed method specifies the ambient temperature, the cooling water inlet temperature, and the cooling water outlet temperature.

5. The outlet condenser water temperature to be 85°, 90°, 90° and 95° F. for suction temperatures of—10°,

5°, 20°, and 40° F. respectively.

6. Ratings to be expressed in B.t.u./hrs. or tons.

Table 1 summarizes the proposed standard rating conditions.

TABLE I—PROPOSED
COMMERCIAL STANDARDS

(With 90° ambient air temperature or 75° F. cooling water)

Suction Temperature	Refrigerant Temperature		Cooling Water Ingoing	Water Outgoing
	Compressor	Entering		
-10	65	75	85	
5	65	75	90	
20	65	75	90	
40	65	75	95	

The committee is also working to establish standard procedures for testing condensing units and unit coolers, as well as capacity ratings for cooling units and conditioners. An appreciable amount of work remains to be done on these projects before agreement is reached, he admitted, but stated that the work is well under way and should be put forth during 1935.

Palatability of Beef Improved by Storage, Investigations Show

NEW YORK CITY—That palatability and tenderness of beef increases while it is stored in a meat cooler was conclusively proved in a series of English experiments, while German investigations have determined the number of days after which, under different storage conditions, beef becomes unsalable as first quality from bacteria, surface color, and mould, Dr. A. W. Ewell of Worcester Polytechnic Institute told members of the A.S.R.E. here last week.

Dr. Ewell's paper was entitled "The Cooler Storage of Beef" and comprised a review of investigations of beef deterioration and remedies.

The English investigations were made with three groups of English men and women tasters who compared the palatability, after cooking, of different cuts of beef from animals varying from prime steers to old cows and bulls. They confirmed the popular belief that longer storage improves the taste of beef, and this was found to be especially true with the poorer cuts.

Reporting the discoveries of Dr. Rudolph Plank's Karlsruhe laboratory in Germany, Dr. Ewell stated that high humidity in meat rooms greatly reduces the loss of weight, but it also increases tremendously the bacterial growth.

"Bacteria will not multiply at a humidity less than 96 per cent," the speaker said, and explained the growth of bacteria in lower humidities by pointing out that the air immediately in contact with meat always has a much higher moisture content than that of the general air in the room.

The oldest and most common method of checking mould and bacteria is air movement, Dr. Ewell continued, but this method has distinct limitations for if humidities are below 80 or 85 per cent, a serious loss of weight is entailed.

"On the other hand, if beef is carried for several weeks at higher humidities, loss is incurred due to the necessity of trimming the contaminated surfaces. Consequently, the modification of air by introduction of gases—particularly carbon dioxide and ozone—has been extensively studied," he said.

"Investigations in England have shown that while carbon dioxide does not kill mould and bacteria, it inhibits their growth, provided a considerable portion of the oxygen in the air is replaced by carbon dioxide," he stated.

"Meat carried at 32° F. in an experimental storage room with an atmosphere in which one-half of the oxygen had been replaced by carbon dioxide (10 per cent carbon dioxide) remained salable for double the time as in ordinary air. The possible storage was still longer when the carbon dioxide concentration was 20 per cent," Dr. Ewell said, again referring to German experiments.

He mentioned several small commercial cold storage plants in England and Denmark which are finding carbon dioxide effective as a mould and bacteria detergent in egg and fruit storage, but was not familiar with any in this country—except aboard ships.

Ozone appeared to be the preference of the speaker for reducing the formation of mould and bacteria.

"Concentrations necessary are only a few ten-thousandths of 1 per cent," he said, "and therefore 'gas-tightness' difficulties disappear. Men may work for an hour or more in room containing the maximum concentrations employed, while in the carbon dioxide room the deficiency in oxygen makes even a short visit impossible."

Since ozone decomposes, falling to one-half the initial concentration in about 15 minutes in the average meat room after the ozone supply has been

cut off, it must be supplied continuously to maintain a constant concentration, he explained, whereas the only loss in carbon dioxide concentration comes from leakage.

"The general Continental custom is to hang the carcasses, immediately after dressing, for about 18 hours in a concentration of 1.5 to 2 parts of ozone per million, and thereafter keep them in storage rooms with a lower concentration."

Dr. Ewell then discussed the use of ozone in this country, describing one particular application in a leading meat house of New York City which he had supervised during installation. Temperature of this room is 37 to 39° F., and the relative humidity from 90 to 92 per cent. Before the introduction of ozone, "whiskers" on the meat were often present, and the loss from trimming was serious, he reported.

"After considerable experimentation, the following procedure was adopted. Following the closing of the storage room at 3 p. m., ozone is introduced for two hours to a concentration of 2.3 to 2.7 parts per million. It is again introduced to a similar concentration from 2 to 4 a. m.

When the meat cutters enter at 4:30 a. m., the ozone has disappeared. With this routine, mould is absent upon beef carried eight weeks, except for occasionally a slight amount at 3 p. m. due to contamination from the outside—doors being frequently opened during the day. This slight growth is removed by the 3 to 5 p. m. ozonizing," he said.

The speaker said customers were critical at first because the meat had no "whiskers" to indicate that it had been aged or ripened, but they have since been taught that ripening has no connection with the presence of mould and bacteria.

Moore Demonstrates Hydrocal's Operation

NEW YORK CITY—Prof. A. D. Moore of the University of Michigan demonstrated his Hydrocal instrument for solving heat transfer problems at the national convention of the A.S.R.E. here Wednesday morning.

The apparatus had previously been demonstrated before the Detroit section of the A.S.R.E., and was described in the Nov. 14 issue of ELECTRIC REFRIGERATION NEWS.

It is an instrument for solving heat transfer problems hydrodynamically, and is built up of a series of vertical inter-connected glass tubes in which a colored liquid is caused to find various levels representing various temperatures.

Thus it is quite easy to show the temperature gradient through a material of uniform heat transfer characteristics—which the speaker did—and it is relatively easy to demonstrate more difficult problems and solve them.

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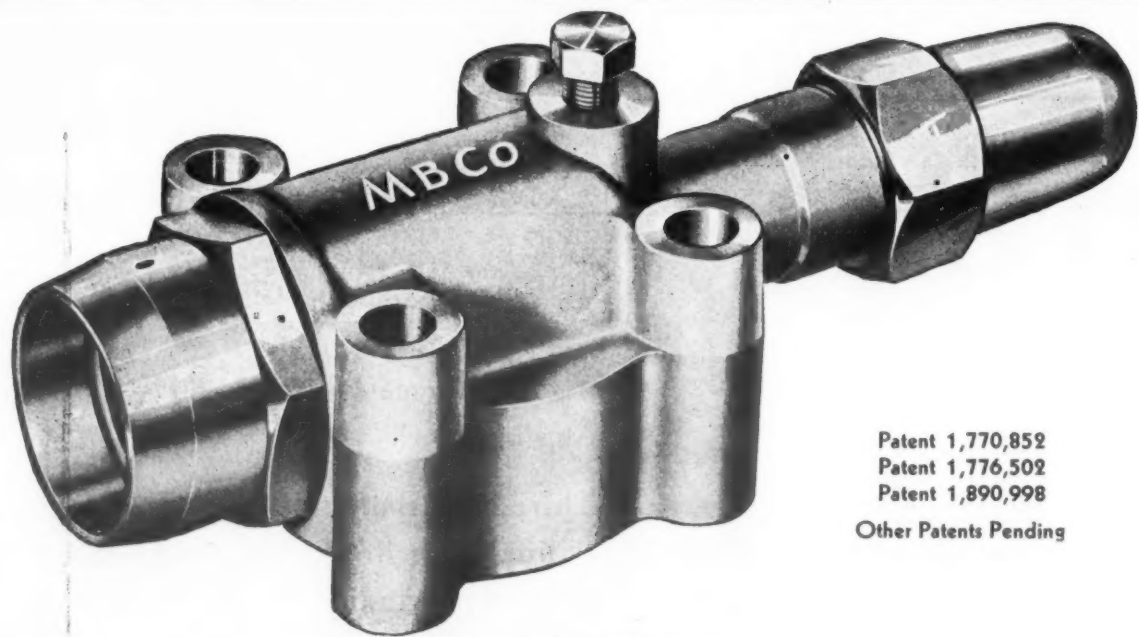
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A-13197 is an exceptionally sturdy valve designed for large commercial units. It is furnished with 1-1/8 in., 1-3/8 in. and 1-5/8 in. tube connections incorporating our patented end for soldered tube connections.

The body is of forged brass-bolt hole centers 2-1/2 in. The compressor surface can be machined to the flat or york type, or to the customer's particular specifications. The stem is made of Tuf-Stuf, an extra-strong corrosion resisting alloy which will not seal itself to the seats. The valve is double-packed.

All Mueller Brass Co. valves and fittings are furnished full flow, equal to inside diameter of tubing used, assuring unrestricted passage of the refrigerant.

Send for our Catalog R-2 illustrating and describing a complete range of valves and fittings, etc. for electric refrigeration work.

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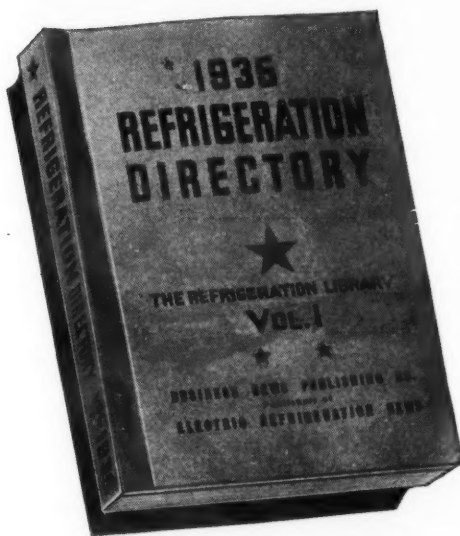
Patent 1,770,852
Patent 1,776,502
Patent 1,890,998
Other Patents Pending

"We're a service outfit
and we're looking for parts.
WHERE CAN WE GET THEM?"

{ A typical mail and long-distance
telephone request to Business News
Publishing Company }

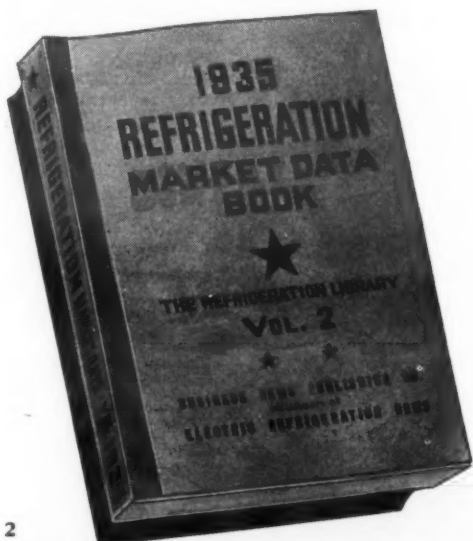


Replacement parts for *all* Electric Refrigerators— *including orphan makes*—are a problem with the rapidly increasing number of Service Organizations



VOL. 1—1935 REFRIGERATION DIRECTORY

Recognized industry register of all trade-marked refrigeration and air-conditioning products. Four complete sections—(1) Alphabetic list of manufacturers; (2) Index of trade names; (3) Classified list of refrigeration equipment, parts and materials with all sources of supply; (4) Geographical directory giving name, address, telephone number, and products of manufacturers. Independent service companies and jobbers of supplies, parts, and materials included.



VOL. 2

1935 REFRIGERATION MARKET DATA BOOK

Veritable encyclopedia of information on refrigeration and air-conditioning industries. All known facts and figures recording development up to date. Systematically arranged and tabulated. Subdivision by territories and types of products for market and sales analysis. Included are household, commercial, and air-conditioning sales statistics—survey of distributive channels—merchandising activity—potential market and other essential data.

A very large market for refrigeration replacement parts is here already and this market is growing with amazing rapidity.

Note these figures. There are more than SEVEN MILLION (7,000,000) household and commercial electric refrigerators in use in the United States. More than SIX MILLION (6,000,000) of both types have been in operation over one year. More than TWO MILLION (2,000,000) have seen five years service.

Many makes of refrigerators included in this huge total are no longer being manufactured. The companies which produced them have passed out of existence—their refrigerators have become "orphans". Machines which have been in use a few years usually require replacement parts and many service organizations do not know where to get them.

What does this mean to service organizations? It means a growing problem in the form of a demand for replacement parts far ahead of the *known supply*.

This Problem May Be Your Opportunity

Obviously here is business—profitable business—definitely available for the manufacturer who will let dealers and service organizations know what parts he can supply. But how can he do this? Very simply and inexpensively.

The REFRIGERATION DIRECTORY AND MARKET DATA BOOK is the information source of the electric refrigeration industry. Everyone in this industry who wants buying or market information turns to its pages. It is the recognized buying guide—the industry register—of all trade-marked refrigeration products.

If your company makes any product or part connected with refrigeration it is listed of course under the proper classifications with no cost to you.

A Listing Is an Insufficient Sales Message

Here is a large and profitable market readily available. Mere listing is not enough of a sales message to impress it! Between a company listed and one represented by an advertisement describing its product or products, telling exactly what it has to offer—which would get the call from service men or dealers? The answer is apparent.

Advertising rates in the coming 1935 edition of the Directory are low—only \$100 per page, \$50 per half-page, \$25 per quarter-page—surely not much of a sales expense to produce possible orders or gain possible customers which would pay for this advertising many times over. Frankly, isn't it just good business to be represented by an advertisement in this Directory? Forms close January 20.

The 1935 REFRIGERATION DIRECTORY AND MARKET DATA BOOK—in two volumes—to be issued February 20, 1935—price \$5.00 per set postpaid in the United States. In combination with a year's subscription to ELECTRIC REFRIGERATION NEWS, \$6.50.

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VOL. 13, No. 15, SERIAL No. 299, DEC. 12, 1934

Looking Ahead

QUESTIONS asked of ELECTRIC REFRIGERATION NEWS by subscribers frequently indicate what's on the industry's collective mind, particularly when certain questions are repeated so frequently that they seem to form a trend in themselves. There was a time, for instance, when the NEWS was flooded with requests for industry statistics. Laboriously and at great expense the desired facts and figures have been published and made available to the industry in the annual editions of the REFRIGERATION DIRECTORY AND MARKET DATA BOOK. Dozens of requests for service information on orphan machines occasioned the publication in ELECTRIC REFRIGERATION NEWS of the service manuals of companies not now making refrigerators. These are but samples.

Right now the most frequently received set of questions have to do with something which is pretty hard to answer: the future. Not in the past several years has it seemed that the industry has ever been so concerned about what's coming next as it is right now. A great many people are asking the question: How much longer is the refrigeration business going to last as a big business? Isn't it about due for a tumble?

Executive Forecasts in January

Annually in January the NEWS presents the forecasts and predictions of the industry's chief executives. These men, whose job it is to finger the pulse of their markets—in order that they may gauge, with a fair degree of accuracy, the coming year's production and order materials accordingly—tell readers of the NEWS just what trends to expect and about how much business will probably be done. Perusal of these letters in bound volumes of the NEWS should convince the reader that in most cases the executives have done a remarkably good job of forecasting.

It would seem, however, that a great many people in the industry want some assurance now that the refrigeration business will be good next year; and to stave off the possibility of an epidemic of the jitters, the NEWS hastens to report what some of the industry's leaders think about the situation at the present moment.

Kelvinator Increasing Appropriations

President George Mason, and Vice Presidents H. W. Burritt and H. G. Perkins of Kelvinator are confident that 1935 will be the best year in Kelvinator's history. This is no idle statement, calculated to warm the hearts of dealers and salesmen. It is a prediction which they are backing with some important money. Never a piker in its advertising and promotional budget, Kelvinator plans to spend considerably more money in 1935 than it has in any previous year to create and increase consumer acceptance for its products. It should be remembered, in this instance, that Kelvinator's star has been in the ascendancy for a long time, that it is celebrating its twentieth year in the refrigeration business, and that in the last couple of years Kelvinator

has done a fine job of bettering its relative standing among the leaders.

T. K. Quinn, vice president of the General Electric Co., has reasons for believing that in 1935 the industry will top even the all-time record which is being set in 1934. "If general business conditions remain about the same," he says, "the refrigeration industry should do about 10 per cent more volume in 1935 than it did in 1934. Should general business gain about 10 per cent over 1934, then the refrigeration industry should go ahead by at least 20 per cent." Like the Kelvinator executives mentioned in the preceding paragraph, Mr. Quinn feels sure that refrigerator prices will rise in the coming year.

Major Blood Sees Big Rise

In the Dec. 5 issue of ELECTRIC REFRIGERATION NEWS, President Howard Blood of Norge Corp. predicts that 1935 volume will be at least 26 per cent better for the refrigeration industry than was 1934 volume! Moreover, he declares that a sales volume of 2,200,000 units—or an increase of 47 per cent!—is entirely possible for 1935. Now Major Blood is not addicted to exaggeration; he is one of the most conservative executives in the entire industry. And when he predicts an increase of this sort, it's something to cause one to sit up and take notice.

Major Blood bases his forecast on a nationwide market study, conducted in October for his company, among 23,012 consumers and 1,042 dealers in 259 American cities. This survey developed a buying intention of 40.3 per cent, as compared with a buying intention of 32.2 per cent last year. That means that 40.3 per cent of all the non-owners of electric refrigerators interviewed declared that they intended or hoped to buy them in 1935.

Frigidaire Getting Set

Frigidaire, which has been keeping its plans very much in the dark this fall, seems all set to spring something, if one may judge by the advertisement which appears on page 3 of this issue.

Powel Crosley, Jr., who provided the biggest selling sensation of 1934 by more than doubling his best previous year's production, is preparing for 50 per cent more business in 1935 than he had in 1934! If you have any doubts about the validity of his beliefs, you can settle them easily by going down to Cincinnati and noting how he is expanding his production facilities.

Westinghouse has spent \$200,000 to enlarge production facilities for 1935; and before a convention of 200 distributors, supervisors, and sales promotion managers, Vice President A. E. Allen declared that 1935 will be the most successful year the electric refrigeration industry has ever experienced. P. Y. Danely, manager of the refrigeration department, R. C. Cosgrove, manager of household refrigeration sales, and H. M. Wible, manager of commercial refrigeration sales, all concurred publicly in this opinion.

Manufacturers Expect Better Volume

The three refrigeration manufacturing units of Dallas E. Winslow, Inc.—Copeland, Zerozone, and Mayflower—are now housed in new and larger quarters in Detroit, which will make possible increased production in 1935. Each of the three subsidiaries is planning to introduce a new and improved household electric refrigerator line within the very near future.

Captain William Sparks of Sparks-Withington is making big plans for a bigger year in 1935. So are Messrs. Otis, Hiter, and D'Olive of Stewart-Warner. Both Montgomery Ward and Sears Roebuck have ambitious programs. Fairbanks-Morse is making preparations for a genuinely aggressive campaign. So is Landers, Frary & Clark.

In other words, there is every indication that 1935 will again be a record breaker for the industry. And, since it seems agreed that prices are likely to rise, dollar volume, as well as unit figures, should show a satisfactory rise, as well.

LETTERS

Insulating Efficiency

Household Equipment Co.
221 E. 11th St.
Oakland, Calif.

Editor:

Will you be good enough to advise us the refrigerator manufacturers who are using kapok or Dry Zero for insulation?

Please enter our subscription for one year for REFRIGERATION NEWS beginning November.

D. FREDERICK QUINN.

Answer:

Dry-Zero Corporation
Merchandise Mart
Chicago, Ill.

Editor:

Replying to your letter of November 2, I do not know of any electric refrigerator manufacturers using kapok *per se* for insulation, but among those using Dry-Zero are Norge, Frigidaire, Grunow, Sears-Roebuck, and a few of the smaller manufacturers.

Two or three of the high-class ice refrigerator manufacturers who have suddenly realized that ice refrigeration, with really competent insulation, is a good deal less expensive than electric refrigeration with poor insulation, are also using the Dry-Zero, and, I may say, in surprisingly large quantities.

Perhaps you can get from the enclosed excerpt of paper by Dr. Finck, then of the Bureau of Standards, one reason for my strong discrimination between "kapok" and Dry-Zero. There is, of course, far more difference between the two than there is between loose granulated cork and good corkboard.

HARVEY B. LINDSAY, President.

Excerpts from "Mechanism of Heat Flow in Fibrous Materials"
By J. L. Finck, Bureau of Standards
Research Paper No. 243

Table 4—Results on tests of specimens prepared with different arrangements of fibers.

Description	K32 Milliwatts cm-1 deg.-1 C
	C
Flax, fibers perpendicular to heat flow	0.343
Flax, fibers parallel to heat flow	.768
Glass wool, fibers perpendicular to heat flow	.375
Glass wool, fibers parallel to heat flow	.80
Hair felt, fibers perpendicular to heat flow	.375
Hair felt specimen, portion of fibers parallel to heat flow	.574
... The conductivity of a fabricated product may be very greatly affected by the arrangement of the fibers.	
... This natural tendency in fiber arrangement accounts for the moderate variations in the conductivity of fibers packed at random, compared with the large range possible with special fiber arrangements.	
... The results of the experiments on fiber arrangements indicate very definitely that the arrangement of the fibers has much to do with the resulting insulating value of a material.	
VII. Conclusions	
... It may safely be said that technique is as important as the choice of raw materials in the manufacture of insulation.	

Education Neglected?

Utilities Engineering Institute
404 N. Wells St., Chicago, Ill.

Editor:

We are heartily in accord with the tenor of your editorial "Refrigeration Schools" appearing in the Nov. 21, 1934, issue of ELECTRIC REFRIGERATION NEWS.

It is indeed unfortunate that a branch of industry so sacred as education should be corrupted with the situation that you have correctly outlined and we believe it would be well for the Refrigeration Industry at this time to guard itself against the trade school corruption that has been the experience of other great industries such as the automotive, electrical, radio, and aviation industries in years past.

That there is a definite need in the Electric Refrigeration Industry for properly trained men is conceded, and with it goes the need for a few competent, reliable, and ethical schools.

However, without being able to render a definite and needed service, any organization has little right to existence. When an organization does not serve well, and does not fill a need, it necessarily follows that methods to promote that organization are very apt to be questionable.

Early in the year 1927, the Utilities Engineering Institute was founded upon the sound principles of its fostering organization, then in its fifty-fifth year as an educational institution. Throughout these eight years the Utilities Engineering Institute has endeavored, sincerely, to conduct a school worthy of the great

industry for which it trains men. The results that have been accomplished bear out the soundness of the training and policies of this reputable organization.

Immediately following our organization, we contacted your publication as well as directing executives of the outstanding manufacturers of electric refrigerating equipment then in existence.

It was the splendid cooperation that we received at that time that gave us the needed encouragement to forge ahead and that prompted the persuasion of policies which have aided the Utilities Engineering Institute in achieving the position in the educational branch of the Electric Refrigeration Industry, that it enjoys today. We are highly appreciative and greatly respect that original inspiration and the continued cooperation that we have enjoyed from ELECTRIC REFRIGERATION NEWS and other leading organizations in the industry during the past eight years.

Each fall season since the inception of Utilities Engineering Institute, a new crop of aspiring refrigeration schools have made their bows. Few have survived though many have collected varying amounts of tuition fees from the public for which completed training had not been delivered.

The Utilities Engineering Institute stands ready to lend any assistance that may be needed by a recognized authority in the refrigeration industry to carry out your suggestion of establishing standards as a guide to schools worthy of recognition.

In this connection you may be interested in reviewing the enclosed address delivered by the writer almost two years ago, to the Detroit Section of the A.S.R.E. which covers the subject of Refrigeration Schools.

May we also suggest, in your creditable efforts to uphold a standard for schools in this field that you communicate with Dr. J. S. Noffsinger, secretary of the Code Authority for the Private Home Study School Industry, 839 17th St., N. W., Washington, D. C., who is known to have done much good work in the accomplishment of the purposes you are endeavoring to achieve. Dr. Noffsinger, has been director of the National Home Study Council for a number of years, the policies of which have been in general, adopted by the NRA Code for this industry.

E. P. SORESENSEN, President.

Kerosene Refrigerators

E. H. Walker
Sales Consultant
1220 Madison Ave., Toledo, Ohio

Editor:

As an old subscriber to your ELECTRIC REFRIGERATION NEWS, and an owner of your REFRIGERATION DIRECTORY, may I ask whether you know of any reliable concern which is coming into the market with a kerosene burning refrigerator?

Our understanding is that Electro-lux, Perfection Stove and Gibson are the only ones who have made attempts so far.

E. H. WALKER.

Answer: See below.

New York City

Editor:

I shall deem it a great favor if you will be kind enough to send me the names and addresses of the manufacturers of refrigerators operated by kerosene.

The market I represent does not hold much promise for other refrigerators operated by either electricity or gas.

If you know of any other system of refrigeration that does away with electricity and gas beside the kerosene I shall appreciate the information.

H. SHIMI, c/o Egyptian Consulate.
Answer: Absorption-type household refrigerators operated by kerosene are manufactured by Crosley Radio Corp., Arlington St., Cincinnati, O.; Electrolux Refrigerator Sales, Inc., Evansville, Ind.; Gibson Electric Refrigerator Corp., Greenville, Mich.; and Perfection Stove Co., 7609 Platt Ave., Cleveland, Ohio.

Another household refrigerator not operated by electricity is the gasoline motor-driven unit made by Waukesha Motor Co., Waukesha, Wis.

Wants New Directory

North Side Electric Co.
3 Amsbury St.
Binghamton, N. Y.

Editor:

Enter my order for a copy of the 1935 REFRIGERATION DIRECTORY AND MARKET DATA BOOK as soon as it leaves the press. Also extend my subscription to NEWS for one year as we can't get along without it.

S. E. MOWRY.

The Editor Blushes

F. B. Connelly Company
Connelly Bldg.
1015 Republican St.
Seattle, Washington

Editor:

We all read your publication with great interest each week and I still maintain sincerely that you are the greatest trade journal editor in the business.

K. A. CONNELLY, Vice President.

ENGINEERING

Mechanics of Heat Transfer in Cooling Coils Are Described

NEW YORK CITY—Mechanics of sensible and latent heat removal in air-conditioning coils and fundamental equations covering the process were discussed by W. L. Knaus of General Electric, Schenectady, in his paper "Heat Transmission in Cooling Air with Extended Surfaces" before the A.S.R.E. convention here Thursday afternoon.

"In air conditioning, the condensation of moisture from the air passing through the coils adds a complicating factor to design, to the prediction of performance," he said.

"For example under some conditions of operation the amount of latent heat removed by a cooler in condensing moisture may be considerably greater than the amount of sensible heat taken away in reducing the temperature of the air," he pointed out. "Thus the necessity of correctly accounting for the effects of dehumidification is apparent."

He then presented a chart with moisture removal plotted as the ordinate against dry-bulb temperature as the abscissa and refrigerated cooling projected in the graph.

With surfaces at a temperature below the dew point of air passing over them, it might be expected that as air progresses through the cooler the temperature of the air would be reduced without condensation of moisture until a point is reached where the air becomes saturated, and thereafter further cooling would cause precipitation of moisture because of the inability of the air to hold its vapor with additional lowering of temperature, he said.

However, a little reflection will show that this is not the process which actually takes place, the speaker declared.

"In the initial portions of the cooler, even though the air stream as a whole has not been cooled below its dew point, the air immediately in contact with the surface is at the surface temperature. Therefore, condensation takes place from the very beginning," Mr. Knaus stated.

He then showed a schematic sketch of air flowing between two refrigerated surfaces, and how air close to the surfaces wipes them at a lower temperature than the air midway between the surfaces.

"The average temperature is taken to be that which would result if the air stream, with the non-uniform temperature distribution, were led into a well insulated mixing chamber," he said. "There will also be a non-uniform moisture distribution across the stream, and an average moisture content which could be measured in the same way as the average temperature."

Assuming these average temperature and moisture concentrations on the first-shown graph, he showed that cooling is not accomplished along the dry-bulb axis alone until saturated air is reached, but that both sensible and latent heat removal is done simultaneously as explained above.

The problem then, is one of determining the nature of the curve, he continued. "Is it straight or curved, and if curved, how much?"

The speaker next launched into a highly technical process of developing a formula representing this curve, and found the curve to be practically a straight line (or under certain conditions slightly curved downward). The equation was

$$h' = h \left[1 + \frac{r (c_1 - c_s)}{s (t_1 - t_s)} \right]$$

Where h' is the coefficient of heat transmission for total heat, h is the sensible heat transmission coefficient, r is the latent heat of condensation of water vapor at the surface temperature, s is the humid heat of the entering air, the quantity $(c_1 - c_s)$ represents moisture removal, and the

quantity $(t_1 - t_s)$ is dry-bulb temperature reduction through the coil.

To show the application of the formula, and also its agreement with actual performance, Mr. Knaus gave a set of test data taken on an extended surface coil and compared them with anticipated results calculated mathematically. The agreement was quite close.

In conclusion he pointed out that a factor which was not taken into account is the effect of temperature gradients in the fin material—and in cases of fins made of relatively poor heat conducting materials, he believes this factor will be of more importance.

Philipp Characterizes Refrigerant Controls

NEW YORK CITY — Giving the characteristics of various refrigerant control devices now in common use and discussing the refrigerating effect with three common refrigerants, Dr. L. A. Philipp, director of laboratories for Kelvinator Corp., Detroit, addressed the A.S.R.E. convention here last week on "The Thermodynamics of Liquid Refrigerant Controls."

At the outset Dr. Philipp presented a graphical chart and a temperature-entropy diagram of the Rankine cycle as applied in refrigeration, describing the course taken by the refrigeration cycle.

A study of these diagrams, he said, reveals the fact that a gain in total refrigerating effect is possible if the cold saturated vapor leaving the evaporator is utilized for subcooling the liquid refrigerant before it flows into the evaporator through the liquid control device, and he then went on to show the quantitative increase in refrigerating effect and efficiency which can be accomplished in this way.

Refrigerant controls described were (1) those which depend upon pressures in the system for their operation, and (2) those which depend on the difference in density of the liquid and vapor for their operation.

In the first class were expansion

valves, the thermostatic valve, capillary tube, fixed restriction, and high-side-low-side pressure difference valves. In the second class were the low-side float and the high-side float.

Berry Discusses Helium & Air as Refrigerants

NEW YORK CITY—"Air as a Refrigerant" was discussed by R. U. Berry of the air-conditioning department of General Electric Co., Schenectady, before the first session of the Wednesday morning meeting of the A.S.R.E. meeting here last week.

Mr. Berry's paper inquired into the possibilities of using the so-called perfect gas machine of the scientist Leblanc, and included the results of a detailed study which he has made of the system.

The Leblanc perfect gas refrigerating machine consisted essentially of an air compressor and an air engine so coupled together that the engine recovered a considerable portion of the work that had to be supplied to the compressor, and so that the exhaust from the engine had a temperature low enough to do useful refrigeration.

When vapor refrigerating machines were developed, the perfect gas machines were rapidly displaced, and are now only of academic interest since the vapor machines are smaller, cheaper, and considered eminently more efficient, he said.

Mr. Berry discussed the use of air and helium as refrigerants, and presented indicator cards and data showing the high pressures that are encountered in working with the equipment.

Gibson Sales & Service Firm Opens in Miami

MIAMI, Fla.—York Refrigeration Co. has opened offices at 1315 N. E. Second Ave. here, offering sales and service on Gibson electric refrigerators. Moe Mann is proprietor and Frank Frost is sales manager.

Research in Shipping Reported by Hukill

NEW YORK CITY—Reporting research activities of the U. S. Department of Agriculture into problems of refrigerated transportation of fruits and vegetables, W. V. Hukill, assistant mechanical engineer of the department, discussed the subject "Experimental Work on Fruit and Vegetable Transportation" at the A.S.R.E. meeting here last Wednesday afternoon. B. F. Fisher, another member of the staff, cooperated in preparation of the paper, Mr. Hukill said.

Most important factor in the preservation of fresh fruit is securing the proper temperature, Mr. Hukill stated, whereas the shipper must also consider problems of the humidity and carbon dioxide gas given off by the fruit. These are the type of problems which the department of agriculture has been studying.

In the course of these studies, a new type of resistance thermometer has been developed for taking temperatures at various points of a car in transit, and instruments have been evolved for taking readings of humidity, carbon dioxide content, and convection currents.

In this connection, Mr. Hukill said that one of the department's discoveries is that painting the roof of a refrigerated freight car a white color is the equivalent of one extra inch of insulation in the roof.

He also mentioned a project into the problem of heating fruit carriers traveling through areas so cold that freezing of the fruit sometimes occurs. Some companies placed straw around the fruit to keep it warm while crossing the cold territories. This isn't a very safe method, Mr. Hukill said.

Members of Mr. Hukill's department found that placing pans of water beneath the fruit was the best solution outside of actual heating of the car; thus, when the car entered cold regions the water began to freeze thus giving off its latent heat of fusion to the fruit and preventing freezing.

For Quietness and Dependability Specify Delco Motors

In no other electric appliance are quietness and dependability so essential as in the household refrigerator. The refrigerator motor must function silently and surely—day and night, year after year. Delco motors do this—because of their advanced design and precision workmanship, and because they possess the four famous Delco features shown below.



1
Automatic Belt Tightener—Delco electric refrigerator motors are now available with this new automatic belt tightener—a device which assures maintenance of proper tension on the belt at all times, thus compensating for belt stretch. This is just one of the features that add to the value of Delco motors.



2
End-Play Take-Up—Delco motors are entirely free from end-play noise. All horizontal movement of the rotor shaft is effectively stopped by the cushioning action of a cork bumper. Adjustment is never necessary—because the cork is properly lubricated at the factory, and wear is negligible.



3
Vulcanized Rubber Cradle Mounting—The rubber ring is vulcanized between the steel plates, and effectively absorbs all the objectionable motor vibration, resulting in a quiet installation. The rubber is held permanently in place by being vulcanized to both plates.



4
Sealed Lubrication—This appreciated feature of Delco motors prevents motor over-oiling, by returning excess oil to a reservoir. This, in turn, stops any oil from getting on the windings. Delco Sealed Lubrication keeps the oil in the motor during shipment—installation—and its years of operation.

DELCO PRODUCTS CORPORATION, DAYTON, OHIO

Steining Develops Refrigerant Control For Hermetic Units

(Concluded from Page 1, Column 4)

covering over the compressor dome assembly so that enough heat is retained within the dome during the "off" cycle to prevent condensation.

This, he pointed out, has the disadvantage that in cold weather the entire compressor assembly becomes cooled to the point where condensation occurs within the dome when the compressor starts to operate again.

Mr. Steining's device is a high-side float control built directly into the base of the compressor, and employing the effect of stratification and density differences of refrigerant and oil to direct oil and refrigerant to their proper places.

Condensate from the condenser is returned to the depressed region in the base of the machine and is metered to the evaporator just as with a conventional high-side float.

"With this arrangement it may be entirely possible to eliminate the external condensing coils by providing sufficient radiating surface on the dome which would serve as the condenser for the system," he suggested.

Liquid sulphur dioxide has a specific gravity of about 1.4 (depending on its temperature) while the lubricant of the mineral oil type has a specific gravity of about .9.

This difference in weight is utilized in the float control so that the float ball sinks when submerged in the oil-rich layer, but will float in the denser sulphur dioxide-rich layer of the mixture of oil and refrigerant in the control device.

It was found that the float performed satisfactorily when its buoyancy was such that it floated in a liquid having a specific gravity of 1.00, he reported.

Oil inlets to both oil pump and oil seal of the compressor are located so that only liquid from the oil-rich mixture enters and is used for lubrication, Mr. Steining explained.

Operation of the system was described as follows: When sufficient

Kelvinator Breaks Ground for Model Home



President George W. Mason and other Kelvinator executives look on approvingly as Frank Couzens, mayor of Detroit, wields a silver spade to break ground for Kelvinator Corp.'s model home, which will be used as a testing and demonstration place for Kelvinator products, including refrigerators and air-conditioning apparatus. The home is scheduled for completion by March 1. Left to right the group includes: R. I. Petrie, domestic sales manager; Mr. Mason; W. R. Crosett, comptroller; Mayor Couzens; V. C. Woodcox, director of advertising; H. W. Burritt, vice president in charge of sales; and C. W. Hadden, director of the project.

liquid refrigerant has condensed and drained into the depressed portion of the base, the float ball will be buoyed up, opening the needle valve and permitting refrigerant to flow into the evaporator—just as in a conventional high-side float control.

19 Charter Members Of A.S.R.E. Honored

(Concluded from Page 1, Column 5)

members in 1904, 19 are still living. Most of them are still active in refrigeration, moreover most of them were present Thursday night to be honored by grants of life memberships.

The complete list of living charter members follows: M. R. Carpenter, Frank J. Flocke, Ezra Frick, E. N. Friedmann, J. C. Goosmann, N. H. Hiller, D. S. Jacobus, L. H. Jenks, F. E. Matthews, J. F. Nickerson, W. E. Parsons, Ellis L. Phillips, William H. Ross, Samuel J. Shipley, Henry Torrance, Henry Vogt, Carl Vollman, Gardner T. Voorhees, and John C. Wait.

The dramatic production, "Ah, Frozen Wilderness," depicted the birth-pains of the very first efforts to coordinate competitive and often antagonistic interests in refrigeration into a cooperative body. Best character was Mrs. W. R. Hainsworth, who played the part of a timid stenographer of that date.

The welcome luncheon on Wednesday noon was addressed by David Cushman Coyle, consultant to the National Resources Board, Washington, on "The Capital Goods Fallacy" which was broadcast over radio station WEAF.

That same noon the women guests met for luncheon in the Terrace Room of the New Yorker, played bridge, and voted to form a women's auxiliary of the society.

The American Society of Mechanical Engineers met simultaneously during the A.S.R.E. convention. Of greatest interest to refrigerating engineers in these meetings was the heat transfer session on Tuesday, the day before A.S.R.E. activities started.

On Thursday morning the women delegates visited the model home at 39th St. and Park Ave., and in the afternoon toured Rockefeller Center.

The same afternoon the men inspected three large air-conditioning systems in the city. First was a centrifugal water vapor system in Bloomingdale's department store (Ingersoll-Rand installation), next the steam jet system in the British Embassy building of Radio City, and finally the Carrene system which conditions studios of the National Broadcasting Co. in Radio City.

John Everetts, Jr., of the consulting firm of W. L. Fleisher conducted the tour through Bloomingdale's installation, whereas A. W. Canney of Clyde R. Place's consulting organization was in charge of the inspection trip to Radio City's air-conditioning equipment.

Friday morning women delegates visited the new Italian steamship, the S.S. Conte di Savoia, and that afternoon the engineers who had not already left the city went through test rooms and the air-conditioned cottage of the Electrical Testing Laboratories, with Gordon Thompson in charge.

Entertainment was in charge of A. W. Oakley, past president.

Spring meeting of the society, probably late in May, will be held in

Detroit, it was decided in council meeting.

Technical papers presented at the regular sessions are reported in varying detail in this issue of ELECTRIC REFRIGERATION NEWS. A brief index follows:

Topic and Speaker	Page No.
Air as a Refrigerant (Berry).....	9
Visual Heat Transfer Measurement (Moore).....	6
Storage of Meat—A Review of Investigations (Ewell).....	6
Advancement and Achievements of Quick Freezing (Poole).....	12
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Thermo-Physics of Liquid Refrigerant Controls (Philipp).....	9
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Refrigeration and Readjustment in the TVA (Woolrich).....	1
Standards and Codes for Small Refrigerating Machines (Timmerman).....	1
Methods of Cooling Retail Beer (Ruppicht).....	12
New Refrigerant Control Device for Hermetically Sealed Machines (Steining).....	1

200 Electrolux Men Meet in Evansville

(Concluded from Page 1, Column 2)

200 sales representatives from Maine to California, who contact with gas company and other dealers, will attend the sessions at Evansville to be devoted to a preview of 1935 models and the explanation of an extensive advertising and selling plan for the new year for more than 3,000 additional outlets in the United States.

President Louis Ruthenburg, of Servel, Inc., will be a chief speaker. Others on the program from New York are Charles G. Groff, a member of the board of directors; Harry A. Strong, vice president, and William Reynolds, advertising manager.

Farm Storage Rooms Planned in South, Woolrich Reports

(Concluded from Page 1, Column 3)

present program of decentralization, the speaker declared, since the whole movement is a national readjustment in our agriculture and much of this adjustment depends on refrigeration.

Refrigeration must contribute to United States agriculture (1) an extension of the Canadian practice of refrigerated farm storage rooms, (2) development of self-contained standardized milk coolers for dairy extension, (3) area cold storage plants to facilitate preservation of community perishable vegetable and meat products for home consumption, and (4) refrigerated storage rooms for curing cheese, butter, and poultry products—now too commonly done with inadequate cellar or spring house.

Farm Storage Rooms

"Stock raisers wait until frosty weather to kill the family hogs; fruit growers utilize caves, night-cooled rooms, and root cellars to preserve their products; while many dairy farmers store their own lake ice in a desperate attempt to carry their milk supply through the summer economically," Prof. Woolrich said in proposing the practice—now followed by some Canadian farmers—of employing a farm storage room.

For our larger farms and plantations, a cold room in the house or cellar requiring probably one ton of refrigeration would greatly extend the storage capacity and net income of the owner, he declared.

The newer lower rate schedules here will make this a popular movement in the more productive areas of the United States, he predicted.

Much inadequate milk-cooling equipment has been foisted upon the American farmer, in the opinion of the speaker, but considerable progress in design of good equipment has been made recently.

The present plan calls for engineering to be done in the design rooms of refrigeration manufacturers for a unit to be delivered and plugged in like a household electric refrigerator, he said. The TVA and the EH&FA have studied the needs, and are preparing specifications on such units for dairymen of the seven states served by the TVA.

Area Cold Storage Plants

"In many areas where the farms are small, or where daily trips are made by the farm operator to centers such as the creamery, cheese factory, or other farm service unit, the area cold storage plant serves a real need," Prof. Woolrich averred.

Ice houses in one southern state accepted the challenge of this new service, and in one year have advanced from one community ice house to 16 offering such service.

"The income secured by the ice house, and the service rendered to the farmer have both been very satisfactory," he reports.

Tradition and much mystery have surrounded the curing and production of many kinds of foreign cheese, foodstuffs, and meats, the speaker pointed out in considering the possibilities of rural curing and storage rooms for this field.

"Definite researches in air conditioning and cooling will reveal that virtually all of these processes can be readily duplicated in America by controlled refrigeration," he said and urged, in conclusion, a closer cooperation between the refrigeration profession and the agriculturist to open this field of refrigeration applications.

"GENUINE DETROIT"

Controls for Air Conditioning are dependable and accurate



No. 250 DUAL PRESSURE CONTROL. For low side pressure or temperature on methyl chloride, SO₂ or Freon commercial refrigeration units in combination with high pressure cut-out. Both features in one instrument.

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Canadian Representative: Railway & Engineering Specialties, Ltd., Montreal, Toronto & Winnipeg.

No. 683-R SOLENOID VALVE. Controls the flow of refrigerant on liquid or suction line. Current consumption approximately 13 watts. Supplied with orifices up to 1/4".



No. 250 LOW SIDE PRESSURE CONTROL. For control according to low side pressure only. Also furnished with remote bulb for temperature control.



THERMOSTATIC EXPANSION VALVES: No. 673, No. 674 and No. 785. For various sizes and types of installations. Always keep evaporators full of refrigerant.

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Manufacturers of Methyl Chloride refrigerating systems are almost unanimous in their selection of ARTIC. Out of 28 manufacturers of all types of commercial systems, 22 use ARTIC. 9 out of 30 manufacturers of all types of household units use ARTIC for dependable refrigeration.

ARTIC has been a standard refrigerant for over 14 years. Low in moisture and acid contents. Available in all types of standard containers from 34 stock points located throughout the country. Write to an authorized ARTIC distributor for prices and other information.

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COMMERCIAL REFRIGERATION

Carrier Will Equip Kentucky Relief Storage Houses

NEWARK—Meat products held in storage for food relief purposes by the Federal Emergency Relief Administration for the State of Kentucky will be kept in condition by Carrier cold diffusers and Carrier-Brunswick refrigerating machines.

An order for more than two carloads of equipment has recently been received through the Brandeis Machinery & Supply Co. of Louisville, Carrier distributor in Kentucky.

Meat storage boxes or stations are being erected in 79 counties of Kentucky and each will be equipped with a complete Carrier product cooling system, consisting of a 50,000 series compressor and a suspended-type cold diffuser.

These food storage stations are being constructed by men on federal relief rolls under government supervision. In addition to the erection of the storage box itself, the men lay the foundation for the compressor and hang each cold diffuser.

The Brandeis Machinery & Supply Co. connects the compressors to the cold diffusers at each location and completes the piping and electrical connections.

Crews of five men each are being organized by the Brandeis company to complete each installation at the rate of one a day. These squads will travel in automobiles.

Some 79 compressors of 1, 2, and 3-hp. capacity and 160 cold diffusers in three different sizes are included in the order.

New Self-Service Dairy Refrigerators Used In Five Stores

SAN FRANCISCO—A new type of self-contained, self-service refrigerator for retail food stores has been installed in five markets operated here by Purity Stores, Inc. Installation was made by Electric Appliances, Inc., General Electric distributor. R. J. Bishop, commercial salesman, engineered the sale.

As can be seen in the photograph, the top section is designed for the unobstructed display of butter, cheese, bacon, etc., with open spaces for self-service. Single-plate glass is used.

Due to the design, air spillage through the open spaces is said to be very slight, with no warm air sucked in over the foodstuffs.

The lower is insulated for the storage of milk, cream, and other more highly perishable items.

A G-E EC-13 evaporator is centered in the fixture below for proper circulation of air through vents into each end of the case.

A temperature of 50° F. is maintained in the upper section and a temperature of 40° F. in the lower storage section.

Compressor is housed in a special compartment in the bottom.

Open spaces in the upper glass compartment are closed at night.

The case itself was constructed by the John Mower Co. of this city.

Importer Describes Proper Way to Cool Wines

NEW YORK CITY—A Norge refrigerator is maintained in the office of The Jos. Garneau Co., Inc., importers, for use in demonstrating proper methods and temperatures for the refrigeration of wines.

Regarding proper cooling of wines, Joseph G. Ringwalt of the Garneau importing firm comments as follows:

"Wine should be placed in the refrigerator at least three or four hours before its intended use. A longer period in the refrigerator will not harm the wine provided it is allowed to remain there until ready for serving.

"The correct temperature for storage of wines is approximately 60° F. but it is of greater importance that the temperature should not vary too suddenly or to extremes. It is also important that wines be kept in a clean place where a certain amount of ventilation is available.

"Champagne and other white wine is usually iced to a temperature of from 35 to 45° F., depending upon the taste of the consumer. To place wine on the ice and then remove it would harm the wine. Placing a bottle in the electric refrigerator three or four hours before it is used brings the wine to a nice temperature. The wine will then not become cloudy unless it is frozen. This is hardly likely to happen as champagne will stand a temperature of about 14° F. and 'still' wines of about 20° F. before freezing.

"It is difficult to estimate the exact temperature at which wines should be served. Red wine, of course, is not iced but is served at room temperature, but the white wines may be iced to suit the taste of the consumer. Champagne is usually iced more than other wines."

Brunner Machines Used In Self-Contained Milk Coolers

UTICA, N. Y.—Emil Steinhurst & Sons, Inc., of this city is manufacturing a line of self-contained farm milk coolers, Brunner commercial condensing units being in all models.

Each cooler is a self-contained portable unit of the submersion type. The refrigerating machine is mounted on the cabinet—coils installed and all connections made. Coolers are shipped ready to operate.

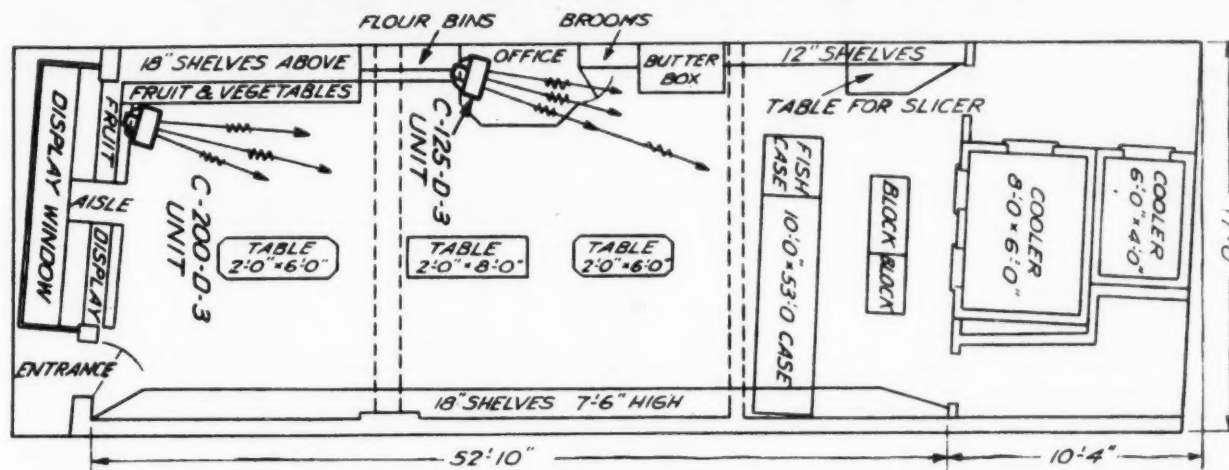
An adjustable automatic temperature regulator makes it possible to provide any temperatures desired, and can be set so as to form a bar of ice on the coils.

Refrigerating coils are made of dehydrated seamless copper tubing, and are anchored to specially designed slotted uprights welded to racks.

Steinhurst milk coolers are manufactured in eight standard sizes from two to 16 10-gal. cans capacity.

Covers are all metal clad and fitted with insulating gaskets. The refrigerating machines are protected by metal ventilated guards. Insulation is three inches of corkboard coated with hydrolene.

Air Conditioning for Patrons & Products



York Ice Machinery Corp. installed suspended-type air-conditioning units in the manner shown above for the University Market in Washington, D. C. In addition to providing comfort cooling for patrons, it aids materially in keeping the displayed foodstuffs in good condition.

York Unit Air Conditioners in Food Store Make Patrons Comfortable & Aid Food Preservation

WASHINGTON, D. C.—Air conditioning units installed by York Ice Machinery Corp. in the University Market here are performing the double function of providing comfort for patrons of the market and helping to preserve foodstuffs on display in the store.

Location of the air-conditioning units, as shown in the drawing, is designed to provide correct air circulation in areas in which perishable foods are kept.

Major benefit, from the food preservation standpoint, has been in the keeping of meats on the block, declares Max Burka, proprietor. The

lowered temperature keeps the large cuts on the blocks firm, eliminates slime, facilitates cutting and insures delivery in excellent condition, Mr. Burka says.

Spinach, lettuce and greens in particular among the vegetables have benefited by the installation of the suspended-type conditioners, according to the proprietor.

Another point that Mr. Burka makes with respect to the value of the air conditioning equipment is that it keeps himself and his help fresh and on their toes during the long working hours characteristic of the retail grocery store.

Holcomb & Hoke Holds Fall Sales Drive

INDIANAPOLIS—As evidence of its belief that the commercial refrigerator market is on the comeback trail, Holcomb & Hoke Mfg. Co., makers of commercial refrigerator equipment, is now engaged in its biggest sales drive since 1930.

A prize contest for its salesmen is being conducted, in which a new Ford automobile will be awarded to every salesman in the Holcomb & Hoke refrigeration division whose volume of sales reaches a specified minimum by Feb. 1, 1935.

The Ford car contest is being carried on in addition to regular monthly prize contests.



Refrigerated Self-Service Case



A refrigerated self-service display case that is also self-contained (refrigerating unit in the bottom) and with a novel top design has been installed in a number of stores operated by a San Francisco chain. General Electric equipment is used.

MEN understand the value of Bonderizing under the finish on household equipment. Years of experience with it in scores of other contacts in the daily routine gives them practical knowledge of its protective value.

In addition to a full appreciation of beauty of line and purity of color, they realize the hazards to which refrigerator finish is subjected, and they know that Bonderizing is a positive aid to finish stability.

Bonderizing under the lacquer or enamel on refrigerators is a compelling "buying" reason to the man who knows. He signs the check with less resistance, for he knows the unit will retain its luster and hold the finish without rusting.



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Parker Processes are the result of 18 years of continuous research, looking to improved technic of rust prevention and better finishes for iron and steel products. Literature describing these processes will be sent on request to manufacturers and technical men.

COMMERCIAL REFRIGERATION

Liquid Carbonic Unit Uses Water To Keep Temperatures Even

(Concluded from Page 1, Column 3)

for any length of time—such as overnight or during an hour or two of idleness—from going lower than the proper serving temperature."

The illustration on this page cuts away the outer shell of this entirely self-contained unit to show the method by which the principle of counter-flow was introduced to accomplish this controlled chilling and prevent it from varying the temperature of the beer at the faucet by more than 2°.

Reference to this illustration shows that at the top of this unit a means of setting the system for a desired temperature is provided. While the majority of bar owners and bartenders serve beer at a temperature varying between 40 and 45°, this apparatus permits the temperature to be pre-determined and maintained within a 2° variation, Liquid Carbonic engineers claim.

The beer, brought through the pipe from the barrel into the cooler box, enters the cooling system at the top of a short spiral coil surrounding the lower portion of the Liquid-Zahn tank. Every second loop in this coil carries the beer, the alternating loop carrying water at a temperature controlled by the refrigerant which enters at the bottom.

Thus the warmest beer coming from the barrel flows constantly in an opposite direction to the water in a parallel coil, the beer being gradually cooled and affected by the coldest chill of the refrigerant as it leaves the bottom coil and ascends a pipe to enter the Liquid-Zahn tank at a point slightly above the center.

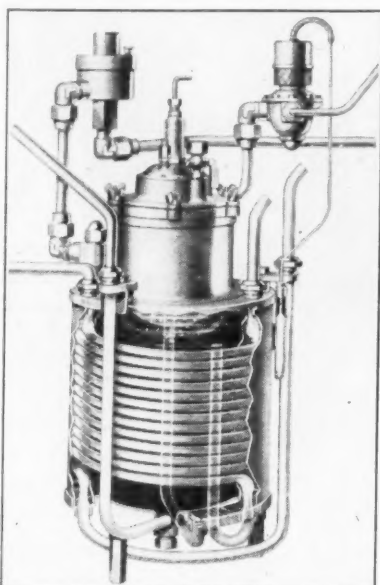
Once the beer is in the tank it is not affected by the refrigerant and its temperature is not further reduced. The chilling of the outer shell of the tank merely tends to keep the beer at this proper serving temperature until drawn from the faucet. The temperature of the beer at the faucet remains constantly within this 2° variation.

During tests, with beer entering the system at 55° F. and with the faucet opened and shut as fast as successive glasses could be filled, temperature of the beer was lowered 15° so that it flowed constantly from the faucet at an even 40° F. Continuing these tests, no beer whatever was drawn for one hour, when a glassful was drawn off and found to be the same in temperature and in taste and body.

To understand fully why this is so, an explanation of the system under which the Liquid-Zahn tank operates is given, the principle being the same whether the tank is adapted for ice packed cooling or for the new mechanical refrigeration.

The beer, under the pressure required to lift it from the barrel, enters the tank at a point somewhat above the center and flows in until the

New Beer Cooler



A counter-flow principle is employed to keep temperature variation at a minimum in Liquid Carbonic's new unit.

tank's capacity of three gallons is reached and raises a float just beneath the dome head of the tank. This shuts off the inflow and permits any excess pressure of gas to accumulate in the dome top.

Here an automatic escape valve allows all but eight pounds of the pressure to escape, and it is this eight pounds of pressure in the top of the tank which send the beer on the rest of its journey to the faucet when the latter is opened.

As the beer is drawn from the bottom of the tank, the designers point out that quiet beer is obtained under a pressure which prevents too great agitation. They claim that from 30 to 70 more glasses can be served from each barrel.

The model Liquid-Zahn is now in production, and the sales organizations of the Liquid Carbonic will merchandise it throughout the country.

Liquor Importing Firm Installs Elaborate Bar

NEW YORK CITY—A mechanical refrigerated bar with striking new features in design has been installed in the sales rooms of the Schenley Products Co., liquor importer, at 20 W. 40th St. here. Brunswick-Balke-Collender Co. made the installation.

The bar itself is an arc approximately 22 ft. long. Entire fixture is insulated throughout and equipped with storage compartments, adjustable shelves, and refrigeration coils.

Front counter is of plywood panels, covered with leather welled in 9-inch boxes, each box trimmed in gold bronze.

Rupprich Describes Handling of Beer in European Tap Rooms

NEW YORK CITY—"Beer is a gentle drink, in two ways—as it treats you and as it wants in turn to be treated," Siegfried Rupprich said in launching into his scholarly discussion of "Methods of Cooling Retail Beer" before the Friday afternoon session of the A.S.R.E. convention here last week.

Mr. Rupprich is a German refrigerating engineer now doing consulting work in New York City, and his first-hand views of Continental practices in the cooling, serving, and drinking of beer were both stimulating and enlightening.

"The better the beer, the more susceptible it is to mechanical and thermal shock," the speaker declared. "Herein lies the secret of why the same brew actually tastes much better in one tap room than in another. Beer requires care."

"Beer needs two days of rest after transportation and it should stand for two hours after tapping with a bung-pipe. This means, except for some rare special cases, that facilities for keeping only one barrel refrigerated are seldom worth while," he said.

In Munich, Bavaria, the town of beer and retired professional men and officers, Mr. Rupprich said, connoisseurs are known to consume six quarts of beer or more daily without losing the ability to recognize the most minute variations in the taste of beers.

"Here even the local authorities, through the department of sanitation, are doing their share in helping to give beer the proper care. They consider piping beer a barbarous Prussian custom and have prohibited it officially. And this is a prohibition which is really enforced!" he announced.

Storage of Beer

"The Bavarian tap room has a cellar where several times the daily requirement of beer is kept in barrels at drinking temperature. The barrel on tap rests in horizontal position on a barrel horse, on a platform which can be lowered to the floor of the cellar to receive a fresh barrel."

"This is rolled, not trundled, in order to avoid disturbing the beer. Like coffee in a cup which is turned, the beer stands still when the barrel is properly rolled. No refrigeration is provided for the barrel on tap, it being taken for granted that it is emptied fast enough not to get too warm."

"In the smaller places, where staid citizens spend their evenings in more or less heated debate, stein in hand, the innkeeper solemnly announces when the last barrel is empty. There is never the question of keeping a broached barrel over night," Mr. Rupprich reported.

He then described in detail some of the beer-dispensing equipments in common use in various European countries—Austria, Bavaria, Prussia, France, and Spain, giving the peculiarities of beer drinkers in Vienna, Berlin, Paris, and Madrid.

European Practices

Among the interesting facts about European practices which Mr. Rupprich brought to his audience were these:

In Germany, the faucets are always arranged so as to make the pouring of beer visible to the customer.

Gadgets appearing on the beer lines in front of German beer coolers are sealed inspection cocks constructed to render part of the inner surface accessible. They enable the public health inspector to ascertain if the beer lines have been cleaned properly.

Two different sediments are found in beer pipes: beer scale and beer slime. The former should never be destroyed by the cleansing agent, and the latter should be removed as soon as possible.

Upon removal of every emptied barrel, the beer line should be flushed out, and a small sponge should be run through it with the water. Brush, sand, soda, or steam should be used only twice a month, and then with care so as not to ruin the beer scale.

Block tin pipes need care against "tin plague," an erosion found on tin which looks very much like the spots on the skin of plague-infected people. Its cause is not definitely known, Mr. Rupprich said, but it can be prevented by keeping the pipes from being at the refrigerated temperature all the time. Warming up the pipes with water once or twice a month seems to be a sure preventive.

Beer pipes should be as short as possible, with smooth bends, of equal cross section throughout, and with flush connections, insulated where exposed to higher temperatures, and never forming gas pockets.

"Germs harmful to beer do not thrive in carbon dioxide, so this gas can thus serve three purposes: to drive the beer to the faucet, to hold the natural carbon dioxide content in the beer, and to keep germs from entering the barrel," the speaker declared.

Commercial Refrigerator Heat Load Table

TABLE 1*
HEAT CONDUCTION THROUGH REFRIGERATOR WALL AND THROUGH GLASS
(B.t.u.'s per 24 hours per sq. ft. of outside surface.)

Temperature Difference In Degrees Fahrenheit	Insulation Thickness (Cork or its Equivalent)			Glass	
	2½"	3"	3½"	Double Thickness	Triple Thickness
40°	84.0	72.0	64.0	440.0	280.0
50°	105.0	90.0	80.0	550.0	350.0
60°	126.0	108.0	96.0	660.0	420.0
70°	147.0	126.0	112.0	770.0	490.0
80°	168.0	144.0	128.0	880.0	560.0
90°	189.0	162.0	144.0	990.0	630.0

*These tables are based on the use of a layer of wood, both inside and outside of the cork. If wood is not used on both sides, consider that the insulation is ½ in. less than the actual thickness.

TABLE 2*
SERVICE LOSSES OF REFRIGERATOR
(B.t.u.'s per 24 hours per cu. ft. of gross interior of refrigerator)

Temperature Difference In Degrees Fahrenheit	USE OF REFRIGERATOR			
	Florist	Grocery or Normal Market	Market With Heavier Service or Freshly Killed Meats	Restaurant Short Order
40°	40.0	65.0	95.0	120.0
50°	50.0	80.0	120.0	150.0
60°	60.0	95.0	145.0	180.0
70°	70.0	110.0	167.0	210.0
80°	80.0	130.0	190.0	240.0
90°	90.0	146.0	214.0	270.0

*Total heat loss is obtained by adding corresponding figures from Table 1 and 2.

Poole Reports Progress In Distribution of Frozen Foods

NEW YORK CITY—A large volume of quick-frozen foods is now being distributed, Gardner Poole, vice president of Frosted Foods Corp., Boston, told members of the A.S.R.E. in their annual winter meeting here last Wednesday, and rapid progress is expected with the perfection of a complete chain of refrigerated transportation from the food producer to the food consumer.

During the course of his talk, Mr. Poole lauded the development of the new portable quick-freezing outfits, explaining that they have been very helpful to the quick-freezing industry because they can be shipped from one producing center to another as various crops ripen in their seasons.

His own company, a subsidiary of General Foods, may have some portable outfits at work in Texas one month, and when the crop is finished the quick-freezing equipment is loaded on flat cars and shipped to New Jersey for a few weeks, and from there perhaps to another part of the country. It doesn't take more than 30 minutes to get the equipment into operation, he said.

Quick freezing is the art of freezing foods by conduction rather than by convection, according to Mr. Poole. It first engaged the attention of a technical meeting at the International Refrigeration Congress in London in 1924. Four years later in Rome, the same association had a paper about quick freezing on its program, and in 1932 when the congress was held in Buenos Aires, Mr. Poole says it was the most important topic of discussion.

One of the questions raised about quick-frozen foods has been whether it destroys any of the vitamin potency of food. It has been definitely proved, Mr. Poole asserted, that the healthful vitamin qualities of food are unimpaired by quick freezing. And he claimed in addition that the bacteria count in quick-frozen foods is lower than with other foods.

One of the requirements of successful quick freezing is that a high quality raw material be used, another is that it be strictly fresh. In the freezing of fruits, Mr. Poole said, factors such as acidity and consistency are quite important considerations.

Following his talk, C. H. Herter of New York City arose to make the point that quick freezing is not a highly expensive process, but costs only about one cent per pound. Mr. Poole agreed, and said that the small additional cost over other forms of food preservation is just about balanced by the savings from elimination of trim of meats, etc.

Askin Tells How to Compute Heat Load

BUFFALO—Joe Askin, chief engineer of the Fedders Mfg. Co. here, has devised a short-cut method of computing the heat load on a commercial refrigeration cabinet of the walk-in type, and for selecting the coil size. The method assumes a factor of 300 for division into the total B.t.u. load to determine the number of square feet of surface required in the coil.

To illustrate the method, he presents a problem of an average size walk-in cooler, 8 ft. wide by 6 ft. deep by 9 ft. high, with 4 in. of cork, and 1 in. of wood inside and out.

Box temperature desired, 38° F. Maximum atmospheric temperature expected, 98° F.

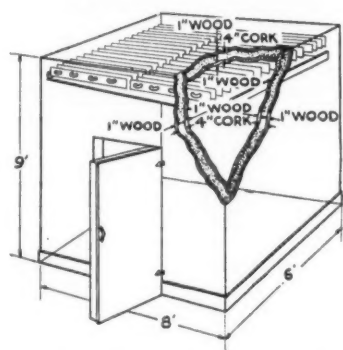
Temperature difference, 60° F. A heavy service load is expected.

Outside surface of refrigerator=2(8x6+9x6+9x8)=348 sq. ft.

Gross interior of refrigerator=7x8x5=280 cu. ft.

Heat conduction through refrigera-

Typical Problem



Sketch of cooler in problem.

tor walls=90x348=31,320 B.t.u. per 24 hours. (See Table 1.)

Service losses of refrigerator=145x280=40,600 B.t.u. per 24 hours. (See Table 2.)

Total heat loss=31,320+40,600=71,920 B.t.u. per 24 hours.

Dividing 71,920 by 300 equals 240 sq. ft. required.

From Fedders bulletin 40-B, page 25 under type A-3, special market coolers, Mr. Askin would select standard coil model No. 8-245-A3 which contains 250 sq. ft. of surface.

Louisville Co. to Sell Kelvinator Line

LOUISVILLE—Philco Sales & Service Co. has been appointed distributor for Kelvinator refrigeration in the local area, it was announced recently.

6 Exclusive Sales Features of

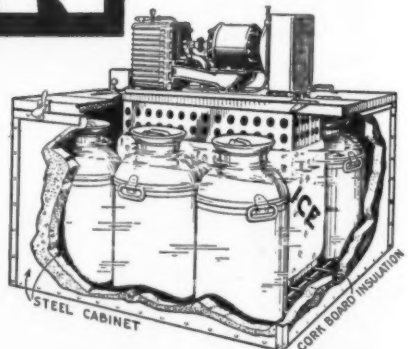
HAVEN

The Haven Oscillating and Reciprocating Compressor is one of many EXCLUSIVE features of the Haven Milk Cooling Unit, furnished ready to use.

MILK COOLER:

1. Patented liquid measuring device is trouble-proof—no adjustment needed—can not be overloaded!
2. No needle valves, compressor valves, belts, crankshafts, connecting rods, piston rings, cylinder side-thrust, delicate mechanisms—NONE!
3. Double-acting compressor actually improves with use! NO compression loss.
4. Simplest, sturdiest compressing unit of any electric refrigeration system! DIRECT DRIVE!
5. Customer satisfaction assured with Haven's simple design, rugged construction, no delicate complicated parts, new basic compression method!
6. Pays YOU A BETTER PROFIT because a Haven eliminates usual causes of servicing.

WRITE today for information on territory, prices—and how you can cash in on Haven dealership, handling America's fastest selling milk cooler and commercial line of high sides from ¼ to 1½ H.P. HURRY.



THE HAVEN COMPANY

530 West Lapham Street, Milwaukee, Wisconsin.

FERRULED

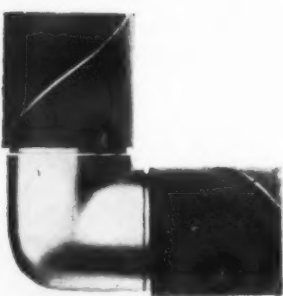


Remember when a ferrule meant corporal punishment: correction by the teacher?

Today, a ferrule means something else. For instance: on every tube seat fitting shipped by Commonwealth Brass Corporation a cardboard ferrule is placed, to protect it against damage until it is installed on the job.

A bit of protection which prevents nicks, scars and bruises which might occur if this ferrule was not used.

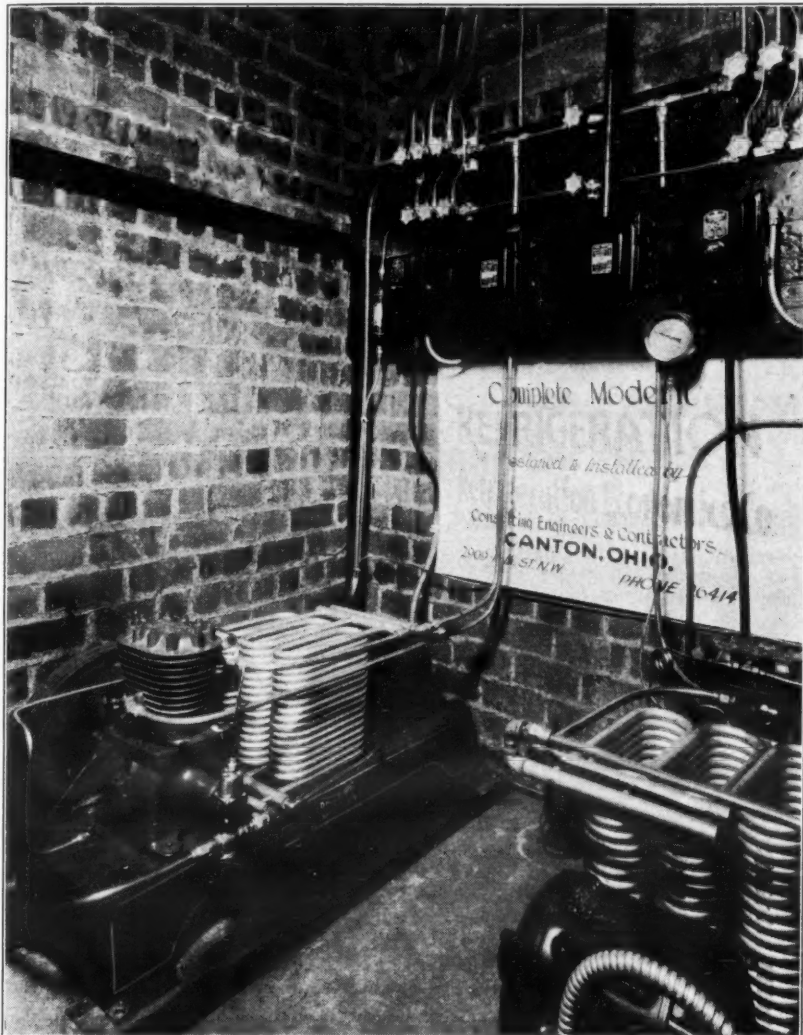
Commonwealth makes a complete line of Seepage Proof Fittings for refrigeration uses and has specialized on this type of work ever since the inception of the industry.



Besides a complete stock of standard size fittings Commonwealth invariably is able to ship, from stock, variants of standard sizes. Special fittings are made to order. Quotations promptly on receipt of sample/blue print/sketch.

COMMONWEALTH BRASS CORPORATION
COMMONWEALTH AVE. AND G.T.R.R.
DETROIT

Compact Machine Room



Two Brunner 3-hp. units occupy this small but neatly arranged machine room in a Canton, Ohio, market. The units are cross-connected.

Brunner Installation in Canton, Ohio Market Featured by Novel Coil Application

CANTON, Ohio—An installation of Brunner commercial refrigerating equipment embodying a number of developments and refinements in the design and installation of coils has been placed in the retail store opened here by Hughes Provision Co., Cleveland.

The location decided upon by the Hughes Co. was in a large general market, which houses a number of other food retailers. Installation of the refrigeration equipment was made by the Refrigeration Economics Co. of this city.

Refrigerated display cases for the Hughes market were furnished by Schwengler-Klein, Inc. of Cleveland and are arranged as a complete oblong. These counters are of the single-glass, top display type with back-bunker coil arrangement. There is a total of 156 ft. of refrigerated display case in the market.

To refrigerate the 16x40x8-ft. meat cooler, one 3-hp. Brunner condensing unit was installed, and another 3-hp. condensing unit is employed for the display cases.

These two machines are cross connected so that in an emergency either one may be used on the meat cooler or counters as is shown in pictures of the small machine room, which measures only 8x6x4 ft.

Cooling coils and drip system in the meat cooler are of a new design. Referring to the illustration on this page, it will be noted that the finned cooling coils have square fins, but that the fins are turned at an angle of 45°, so that water drips from the low point of the fin during the defrosting period.

This condensation water is caught in small aluminum V-shaped troughs which are suspended directly below the point of the fins. The water runs from the troughs into aluminum end gutters from which point it is led through copper drains to the sewer.

These small V-troughs are said to offer very little obstruction to air passage. Thus the cold air drops directly down from the cooling coils, and rapid air circulation is gained. A thermometer hung from the drip system in the center of one of the coils and within 1 inch of the coil surface shows that the coldest air in the room is only 1½° F. colder than the air at the warmest point of the room, according to Brunner engineers.

There are three finned coil cooling units in the meat cooler having a combined total surface of about 2,400 sq. ft.

This liberal amount of cooling surface combined with the rapid air

circulation makes possible about a 15° F. temperature differential between the room and refrigerant temperatures.

Relative humidity has been checked repeatedly by a sling psychrometer and found to be 90 to 92 per cent, which Brunner engineers say is not too high when there is rapid air movement. In spite of the high humidity there is said to be no precipitation of moisture on the ceiling or walls and none on the aluminum drip troughs.

Service recorder charts show that the 3-hp. condensing unit operates a little less than eight hours out of 24 for normal days. On days when the market receives 12,000 to 14,000 lbs. of warm meat in the cooler, the running time is greater and has been as much as 13 hours out of 24.

Cooling coils for the display cases are of the finned type and about 2,000 sq. ft. of cooling surface is used.

These cases are kept under refrigeration 24 hours a day. The fresh meats are taken out of the cases at night but refrigeration is maintained in them for the benefit of the smoked and salt meats which remain in the counters.

The 3-hp. condensing unit hooked up to the cases operates a little less than eight hours a day on normal days. On Saturdays it is the practice of the market to remove all the doors to the cases so that the 20 clerks may have quick access to all of the trays. With all of the doors open, the refrigerating unit operates somewhat longer.

Owing to the location of the coils, the temperature directly below the coils is 14 to 15° F. colder than in the meat storage space. Relative humidity in the cases is kept at 75 per cent with a store temperature of 70° F. with 50 per cent relative humidity. When the store is unheated and its relative humidity higher, the humidity in the case will rise.

International Nickel Co. Executive to Talk On Corrosion

NEW YORK CITY—O. B. J. Fraser, superintendent of technical service for International Nickel Co., Inc., will deliver a talk Dec. 19 before the Washington, D. C., Society of Engineers in which he will discuss "Corrosion from a General Engineering Standpoint."

Formerly in charge of the company's laboratory research, Mr. Fraser has had opportunity to study closely the corrosion problem. His subject will include such topics as concentration cells, film formation, importance of variables such as degree of agitation and amount of oxygen present in determining oxidation concentration, and the effect of the presence of impurities upon the rate of corrosion.

Sherer-Gillett Installs All-Porcelain Market

LANSING, Mich.—An all-porcelain market has been installed here by the Sherer-Gillett Co., manufacturer of commercial refrigerator equipment.

The market which has been equipped is that operated by Schmidt Brothers, and is located at 904-906 Saginaw St.

Display equipment installed consists of one 8-ft. case for delicatessen products; two 10-ft. meat display cases; a 6-ft. fish case, and a 4-ft. fish cleaning sink.

All display cases are equipped with diffusion type coils and are operated from a new Universal Cooler commercial condensing unit located in the basement.

The new 8x10-ft. meat cooler is operated from an existing ammonia refrigerating machine.

All of the equipment in the store, including all wall treatment, is finished in porcelain.

Purolator Builds New Line of Filters

NEWARK—Motor Improvements, Inc., here is bringing out a new line of Purolator filters for industrial and commercial filtration of refrigerating fluids, waxes, food products, sugar and syrups, gasoline, paints, varnishes and lacquers.

The new line embraces types and sizes which, to some extent, it has been possible to standardize. The filters range in size from tiny units 2 in. long by ½ in. in diameter to huge castings nearly 6 ft. long and over 3 ft. in diameter.

Lazarus Will Distribute Crosley Radios

COLUMBUS, Ohio—R. C. Bohannon, president, R. C. Bohannon, Inc., Crosley distributor for central Ohio, announces that F. & R. Lazarus & Co., Columbus department store, has taken on the complete line of Crosley radios.

McCray Designs New Display Case for Delicatessens

KENDALLVILLE, Ind.—McCray Refrigerator Corp. has just introduced a new 6-ft. two-shelf delicatessen display case, with bottom storage compartment for bottled goods or reserve storage.

The case is equipped with a McCray six-tube coil in the top, having copper fins with ½-in. spacing. There is also a booster coil along the inside front, a two-tube copper coil, having ½-in. fin spacing.

Capacity of the case is 35.5 cu. ft. and there are 27 sq. ft. of shelf area.

Walls of the case are about 3 in. thick and are insulated with 2 in. of corkboard, sealed with hydrolene. The display compartment has three thicknesses of glass. Illumination is by the McCray method of exterior lighting.

Exterior front, top and ends of the new case are of white porcelain with black trim and base. The rear of the case is oak, finished silver gray.

York Units Condition Market & Cool Cases

BALTIMORE, Md.—York Ice Machinery Corp. has furnished equipment both to refrigerate commercial refrigerator equipment and to provide comfort cooling in Schreiber Bros. meat market here.

Refrigerator equipment includes three 12-ft. double-duty meat display cases and an 8-ft. delicatessen display case. These are handled by a 2-hp. York Freon condensing unit.

Air conditioning of this market was accomplished by the installation of a York 4x4 Freon water-cooled compressor and a 10-ton York ceiling-type air conditioning unit.

Modernistic Store Is Equipped by Herrick And Frigidaire Corp.

WATERLOO, Iowa—The new retail food market opened here recently by Thomas Meisch, who has been in the grocery business for 23 years, has been equipped with Herrick commercial refrigerators and Frigidaire commercial refrigerating units.

Refrigerator equipment installed consists of a Herrick model 2408 display case and a 10x8-ft. porcelain cooler with three glass service doors and two solid service doors on the front.

A Frigidaire 1-hp. water-cooled compressor supplies refrigeration to DX coils in the cooler and diffusion type coils in the display case.

Store design is definitely modernistic. Walls are finished in cold blue bands, alternated with sea green. Front of the shelving is finished in silver. Herrick also furnished partitions on either side of the cooler (which is centered at the back of the store).

G-E Installs Equipment For Richmond Club

RICHMOND, Va.—Commonwealth Club of this city has recently been equipped with General Electric commercial refrigeration equipment for its kitchen.

Equipment installed consists of a large, specially built kitchen cabinet, and an ice cream cabinet, operating from a CM-5W commercial condensing unit. A CM-5W condensing unit furnishes refrigeration for a walk-in cooler in the basement.

Ed Garrett, commercial manager of R. S. Montgomery, Inc., G-E distributor, engineered the installation.

Wagner type RA repulsion-start-induction



... the motor that dominates the large single-phase motor field

There are several good reasons why Wagner's type RA repulsion-start-induction motor is so extensively used where integral-horsepower motors are needed on single-phase circuits.

1. It is self-contained—that is, it does not depend upon auxiliary devices to help it get started.
2. Its starting-torque is very high. At the same time, the starting-current is comparatively low.
3. The brushes lift when the motor approaches full-load speed. The RA starts as a repulsion motor, and when the speed reaches a predetermined value, an automatic mechanism short-circuits the rotor windings, converting the motor into an induction motor. The same mechanism also lifts the brushes, as they aren't needed after the rotor-windings are short-circuited. Thus interference with radio reception is minimized, and brush noise, brush and commutator wear and brush friction are limited to the brief starting period only.

Ever since Wagner put the first commercially successful single-phase motor on the market in 1896, this type of motor has dominated the large single-phase motor field. Wherever integral-horsepower single-phase motors are required, the Wagner RA is the logical choice. For complete description ask for Bulletin 173.

Wagner Electric

MOTORS TRANSFORMERS FANS BRAKES

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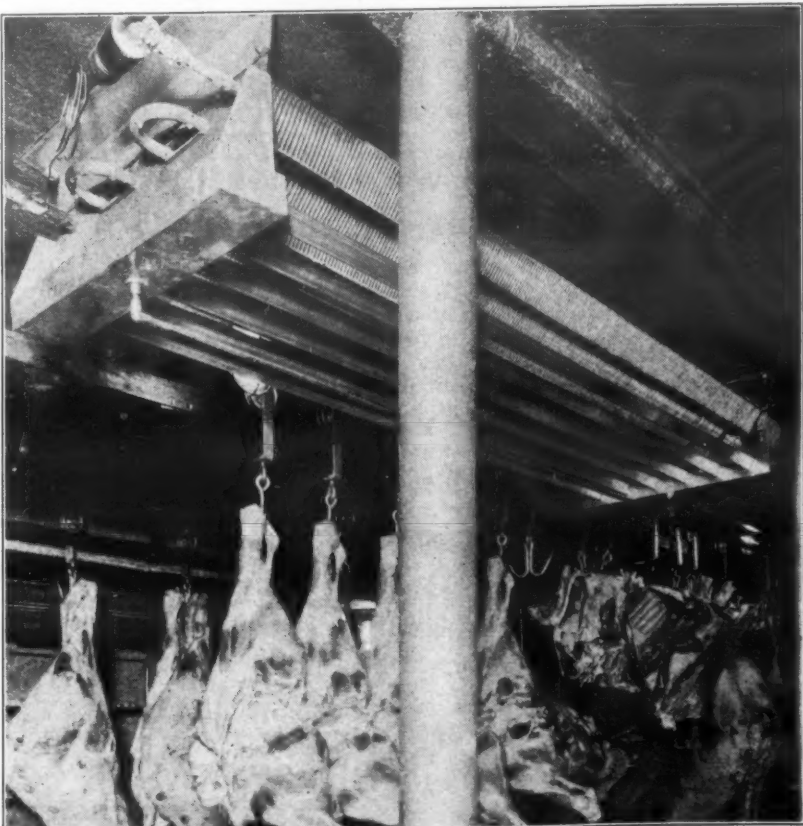
L234-3A

Please send copy of Bulletin 173 on integral horsepower single-phase motors.

Name _____ Position _____
Firm _____
Address _____

If also interested in Fractional-horsepower motors, place "X" here. ☐

New Coil Arrangement



Coils were installed by Refrigeration Economics Co. at an angle so that condensate will be caught in V-troughs as shown below the coils.

PATENTS

Issued Nov. 27, 1934

1,981,848. REFRIGERATING MACHINE. William D. Drysdale, Buffalo, N. Y., assignor to Walter J. Sugden, West Roxbury, Mass. Application Aug. 4, 1932. Serial No. 627,417. 13 Claims. (Cl. 248-16.)

10. In a convertible mounting for a refrigerating unit, the combination of a platform having a depressed portion to receive said unit and elevated portions extending laterally from said depressed portion, a base beneath said platform, hollow supports interposed between said base and said elevated portions, resilient means within said supports and interposed between said base and said elevated portions, and means extending within said supports to urge said platform downwardly and to utilize said supports to support said platform rigidly with relation to said base.

1,981,916. HUMIDIFIER. Burton L. Huntley, Minneapolis, Minn. Application December 2, 1932. Serial No. 645,371. 14 Claims. (Cl. 219-38.)

1. In a device of the kind described, a casing formed with a vaporizing chamber provided at its bottom with a drip pan, a water-spraying device arranged to deliver a spray above said pan, means for forcing a circulation of air through said vaporizing chamber, an offset warming chamber opening into the upper portion of said vaporizing chamber, and means for shunting a part of the circulated air through said warming compartment.

1,981,952. AIR CONDITIONING SYSTEM. Benjamin S. Foss, Brookline, Mass., assignor to B. F. Sturtevant Co., Boston, Mass. Application March 23, 1934. Serial No. 716,932. 8 Claims. (Cl. 257-8.)

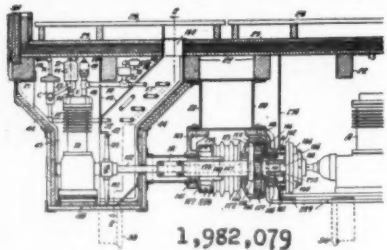
1. Air conditioning apparatus comprising a combustion chamber, means for producing hot gases in said chamber, a heating plant including means for heating water, an absorption refrigeration plant including means for heating a refrigerant, air heating coils associated with said heating plant, air cooling coils associated with said refrigeration plant, means for passing the air to be conditioned over said coils and into the space to be served, means responsive to temperature conditions for alternatively passing gases from said chamber through said heating plant or through said refrigeration plant, and means also responsive to temperature conditions for controlling said first mentioned means.

1,982,075. METHOD OF MAKING REFRIGERATING APPARATUS. Lawrence C. Smith, Buffalo, N. Y., assignor to Fedders Mfg. Co., Inc., Buffalo, N. Y. Application March 23, 1932. Serial No. 600,604. 5 Claims. (Cl. 113-118.)

1. The method of making refrigerating devices which comprises forming a sheet of material with a serpentine depression, then placing a preformed section of tubing in the depression in said sheet, said section of tubing having a diameter greater than the depth of the depression, placing a sheet on said section, forcing the sheets together to flatten said section in substantial conformity to said depression, and finally securing said sheets together.

1,982,079. TEMPERATURE CONTROLLED VEHICLE. Carl W. Spahr, Chicago, Ill., assignor to Mechanical Refrigerated Car Co., Chicago, Ill., a corporation of Illinois. Application July 5, 1932. Serial No. 620,774. 10 Claims. (Cl. 257-7.)

1. In a railway car having a revenue-producing compartment, the combination with means for refrigerating said compart-



1,982,079

ment, including a refrigerant compressor; of means for heating said compartment, including an air compressor; devices, common to both of said compressors for driving the same from a car axle, said devices including means for automatically distributing the power to the respective compressors in accordance with different load conditions.

1,982,108. LIQUID LEVEL REGULATING APPARATUS. Emil Kagi, Winterthur, Switzerland, assignor to firm Sulzer Freres Societe Anonyme, Winterthur, Switzerland. Application Jan. 23, 1933.

FOX COMPANY
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Vol. 9—May 3 to Aug. 30, 1933. (Serial Nos. 215 to 232.)
Vol. 10—Sept. 6 to Dec. 27, 1933. (Serial Nos. 233 to 249.)
Vol. 11—Jan. 3 to April 25, 1934. (Serial Nos. 250 to 266.)
Vol. 12—May 2 to Aug. 29, 1934. (Serial Nos. 267 to 284.)

Price \$3.00 per volume, f.o.b. Detroit. Shipment will be made by express collect unless otherwise specified. Please send remittance with order.

Electric Refrigeration News, 5229 Cass Ave., Detroit, Mich.

Serial No. 653,129. In Switzerland Feb. 9, 1932. 10 Claims. (Cl. 62-8.)

1. In a refrigerating system including an evaporator containing a lubricant, and a refrigerant of lesser specific gravity, a container separate from the evaporator and communicating therewith in such a way that the lubricant will rise in the container from the evaporator to a level indicative of the amount of refrigerant in the evaporator, a float in said container for actuation by the lubricant moving therein and thereout, and means controlled by the float for regulating the supply of refrigerant to the evaporator.

1,982,137. HUMIDIFIER HEAD. George C. Hanley, Malden, Mass. Application Feb. 15, 1933. Serial No. 656,544. 4 Claims. (Cl. 299-86.)

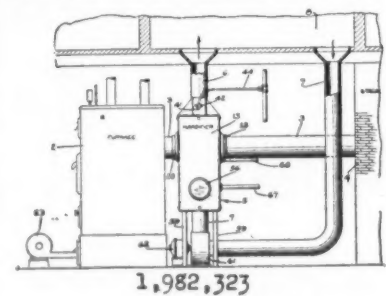
1. A sectional humidifier head including a chambered body section and a cupped outer end section, the body section having an annular internal wall defining the margin of water chamber, an annular upwardly facing diaphragm seat above said wall, an annular internally threaded curb above the diaphragm seat, a combining nipple projecting from the body section, and means forming the bottom of the water chamber; the cupped outer section having a top portion constituting the cover of an air chamber, and an annular flange having an external thread engaging the internal thread of said curb, and an internal annular wall defining the margin of the air chamber; a diaphragm bearing on said seat and forming the top of the water chamber and the bottom of the air chamber, said diaphragm being marginally clamped against its seat by the top section flange, the combining nipple constituting an element of vaporizing means and having a water duct communicating with the water chamber, and an air duct communicating with the air chamber, said vaporizing means including also a small bore inner tube formed separately from the combining nipple secured in the water duct thereof, and projecting outwardly from the nipple, and a larger outer tube secured to the combining nipple and forming an air space surrounding the inner tube and communicating with the air duct, the outer tube having a constricted orifice surrounding the outlet end of the inner tube and forming therewith an annular outlet formed to emit an annular air jet surrounding the water jet emitted by the inner tube, the outer end of said orifice being substantially flush with the outer end of the inner tube, whereby air emitted by said orifice is prevented from retarding the emission of water from the inner tube, the curb of the body section and the flange of the top section being formed to constitute means unaffected by rotative adjustments of the outer section for conducting air from the air chamber to the air duct of the combining nipple, means being provided for admitting water to the water chamber and air to the air chamber.

1,982,305. AIR CONDITIONING SYSTEM. Clarence C. Hunick, Palisade, N. J. Application Sept. 26, 1932. Serial No. 634,806. 5 Claims. (Cl. 261-122.)

1. A method for conditioning air for an enclosure which comprises saturating air at a predetermined controlled temperature by passing the air through a body of water, controlling the temperature of the body of water, then heating the saturated air to a predetermined controlled temperature by means of a controlled quantity of waste heat from the vented air from an enclosure.

1,982,323. HUMIDIFIER. Edward H. Roberts, Minneapolis, Minn., assignor, by mesne assignments, to Minneapolis Air Conditioner Co., Minneapolis, Minn., a corporation of Minnesota. Application Feb. 18, 1931. Serial No. 516,583. 9 Claims. (Cl. 261-15.)

1. A humidifier comprising a jacket having air circulating connections with the space to be humidified, a casing dis-



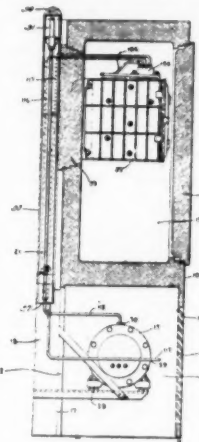
1,982,323

posed within said jacket and having its walls spaced from the walls thereof to provide air circulation passages, the walls of said casing defining a heating chamber having means for connecting it with the usual smoke pipe of a furnace whereby the furnace gases may circulate there-through, a water leg secured to and depending from the upper wall of said casing and arranged to cause the furnace gases entering said casing to impinge thereagainst whereby the water therein is vaporized, and a lateral extension on said water leg communicating with the interior thereof, and whereby the surface area of said leg is increased to effect quicker vaporization of the water therein.

1,982,375. REFRIGERATOR. Frank Conrad and Christian Aalborg, Pittsburgh, Pa., assignors to Westinghouse Electric and Mfg. Co., a corporation of Pennsylvania. Application July 8, 1927. Serial No. 204,401. 12 Claims. (Cl. 62-116.)

1. A self-contained mechanical refriger-

ator comprising a cabinet having superposed compartments including an insulated food storage compartment having



1,982,375

a movable closure and a machine compartment, an insulating partition between said compartments, a compression unit disposed in the machine compartment, a removable portion formed in a wall of the food storage compartment, a heat-absorbing unit mounted on said removable portion, a common supporting means for the compression mechanism and the removable wall portion and refrigerant conduits operatively connecting the compression and heat-absorbing units, said conduits extending for a considerable portion of their length substantially parallel to the common supporting means.

1,982,429. COOLING UNIT. Harold A. Greenwald, Detroit, Mich., assignor, by mesne assignments, to Kelvinator Corp., Detroit, Mich., a corporation of Michigan. Application June 15, 1931. Serial No. 544,667. 6 Claims. (Cl. 62-126.)

1. An evaporator for a refrigerating system, comprising in combination, a plurality of concentric shells joined at either end with the intermediate portions thereof of spaced from one another to provide a closed chamber for a refrigerating medium, the inner of said shells having narrow downwardly extending corrugations at the bottom thereof and the material between said corrugations being wider than said corrugations to provide a large heat absorbing surface for supporting an ice tray.

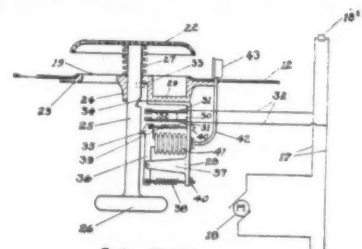
1,982,570. COOLING DEVICE. Harry E. Cann, West Chester, Pa. Application Dec. 30, 1932. Serial No. 649,626. 7 Claims. (Cl. 257-204.)

4. A cooling device including a tank, a partition extending upward from the bottom of the tank and dividing the same into two compartments of unequal capacity each being adapted to receive a given number of cans of a given size to be cooled, a cooling liquid in the larger compartment extending to the top of the partition whereby the same may overflow said partition into the smaller compartment upon introduction of cans into the larger compartment, the capacity of the smaller compartment being such as will cause the cooling liquid therein to rise to substantially the height of that in the larger compartment when the said given number of cans are placed in each compartment, means in the larger compartment for cooling the liquid therein, and means for circulating the liquid from the smaller compartment to the larger compartment.

REISSUE

19,385. CIRCUIT CONTROL MECHANISM FOR MECHANICAL REFRIGERATING APPARATUS. Frederick R. Erbach, Beloit, Wis., assignor to Kelvinator Corp., Detroit, Mich., a corporation of Michigan. Original No. 1,824,774, dated Sept. 29, 1931. Serial No. 241,072, Dec. 19, 1927. Application for reissue March 21, 1933. Serial No. 661,948. 12 Claims. (Cl. 62-4.)

10. A refrigerating system comprising a cooling unit, means for circulating a refrigerant medium through said unit and



19,385

operable to maintain a predetermined normal cooling unit temperature, means for temporarily modifying the operation of the circulating means and a temperature responsive device responsive solely to temperatures other than those normally maintained in the cooling unit for automatically reconditioning the system for normal operation.

Former U. S. Ambassador Buys Equipment

BALTIMORE — A former United States ambassador to Italy, John M. Garrett, has installed \$800 worth of Kelvinator commercial refrigeration equipment in his residence on North Charles St. here. Because of recent kidnapping threats, he would permit no photographs to be made of himself or of the installation in his home.

Harry Moll to Distribute Kelvinator Units

DENVER—Harry Moll, Inc., distributor for Philco radios, has been named distributor for Kelvinator household electric refrigeration in this territory.

The distributing firm recently moved into new quarters at 444 14th St. here.

Coal Mine Commissary Buys G-E 'Conditioned-Air' Chilling Units

CHARLESTON, W. Va.—A large commercial installation was made recently by Harry Gruber, commercial manager of Electric Home Appliance Co., G-E distributor here, for the commissary department of the Carbon Fuel Co., coal mining operators of Decota, W. Va.

Two storerooms were involved, one for meats and the other for fruits and vegetables.

Seven EC-9 "Conditioned Air" chilling units were installed, operated from CMF-6W 2-hp. and CMF-8W 5-hp. condensing units.

An HDS-148 display case, "Conditioned Air" equipped, completes the installation.

Mr. Gruber later obtained another order from the company for Russ beer dispensing equipment and bottle box, operated from a CM-5A condensing unit.

BUYER'S GUIDE

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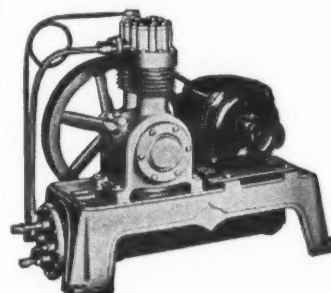
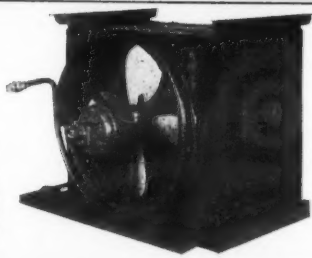
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Manifolded for FREON

and greater than 20° differentials between air and refrigerant for process and commercial comfort cooling applications. SEND FOR new literature about these Coolers.

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Main Offices and Factory, TRENTON, NEW JERSEY
NEW YORK, 210-212 West 65th Street PITTSBURGH, 5114 Liberty Avenue



Style EW—Water Cooled
With Water Cooled Head

STARR FREEZE OUTSTANDING PERFORMANCE attested by satisfied users — EVERYWHERE!

Sturdy Condensing Units from 80 to 2868 Lbs. I.M.E. and all other commercial refrigeration equipment—Wall type cases with machinery—A beautiful household line of modern, conservative styles—Write for full data.

THE STARR COMPANY

Cable "Starr" Richmond, Indiana (factory) Since 1927
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NO MOISTURE ACCUMULATION

The construction of the corrosion-proof Stainless Steel Ranco KR does not permit Moisture Accumulation. Write for Bulletin.

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THE AUTOMATIC RECLOSING CIRCUIT BREAKER CO. - - - Columbus, Ohio



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TWO NEW HINGES

No. 1073 16" Strap
No. 1077 22" Strap
Heavy Duty hinges of finest quality Brass equipped with two case-hardened, ball-bearing washers and an additional supporting lug.

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A convenient way to keep your back issues of the News

We offer a binder designed and made especially for keeping your file copies of Electric Refrigeration News neat and always available for ready reference.

It is made of stiff board covers, attractively bound in good quality of black imitation leather. The name Electric Refrigeration News is stamped in gold on the front cover and backbone.

The price is \$3.75 shipped to you post paid in the United States and Possessions and Pan-American Postal Union countries. For all Foreign countries, postage based on a shipping weight of 6 pounds must be added to this price. Send your remittance with order. May we send you one?

Electric Refrigeration News, 5229 Cass Ave., Detroit, Mich.

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• STEEL ROLLERS



Patent Pending

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TUBE CUTTER

3 sizes: No. 10, 1/4"-3/4"; No. 20, 1/2"-1 1/4"; No. 30, 1"-2 1/4". Has large replaceable tool steel cutter wheel, ground edge. Rollers reduce friction to minimum. The ideal tool for hard drawn tubing.

HENRY VALVE CO.

Specialized Valves & Fittings for Refrigeration
1001-19 N. Spaulding Ave., Chicago

WRITE FOR BULLETINS DESCRIBING HENRY REFRIGERATION SPECIALTIES

QUESTIONS

Slagel's Address

No. 1976 (Manufacturer, Indiana)—"I would appreciate the address of Frank Slagel."

Answer: Frank Slagel can be ad-

dressed at 923 E. Third St., Los Angeles, Calif.

Starting Controls

No. 1977 (Dealer, New York)—"I am enclosing a money order for a year's subscription to ELECTRIC REFRIGERATION NEWS and also would like to ask for the following information:

"Could you tell me the name of any company manufacturing large automatic starting controls, able to take care of a 2-ton ammonia job, using

a 5-hp. Howell motor, 3 phase, 60 cycle, 220 volts, 1,200 r.p.m.

"Have written several places, but have not been able to locate any, only safety cut-outs, advising me they were to be used with automatic starter."

Answer: The following are manufacturers of automatic starters for alternating current motors:

Allen-Bradley Co.
1326 S. Second St., Milwaukee, Wis.
Cutler-Hammer, Inc.
315 N. 12th St., Milwaukee, Wis.
General Electric Co.
Industrial Dept., Schenectady, N. Y.
Square D Co.
710 South Third St., Milwaukee, Wis.
Westinghouse Electric & Mfg. Co.
East Pittsburgh, Pa.

Solenoid Valves

No. 1978 (Importer, Italy) — "We would thank you for the names and addresses of the principal makers of solenoid valves."

Answer: Automatic Products Co., 121 N. Broadway, Milwaukee, Wis.; Alco Valve Co., 2628 Big Bend Blvd., St. Louis, Mo.; Detroit Lubricator Co., 5842 Trumbull Ave., Detroit, Mich.

Total Units in Use

No. 1979 (Manufacturer, New York) — "We are interested in obtaining statistical information as to the amount of household refrigerators now in use on the American market as well as the number supplied by each respective manufacturer."

"We would thank you to furnish us with the above mentioned information and any other information pertaining to same that you may have on file."

"If you are unable to furnish us with this information, will you please advise us where we can obtain the same."

Answer: As of the end of September, 1933, we estimated the national average saturation of the household electric refrigerator market to be roughly between 27 and 28 per cent of the number of wired homes, indicating about 5,650,000 refrigerators in use in the United States.

With regard to the numbers of various makes in use, we do not have this information, as sales by individual manufacturers are not made public. Manufacturers who are members report their sales to the Refrigeration Division of National Electrical Manufacturers Association (Nema) and only totals are released. These figures are published monthly in ELECTRIC REFRIGERATION NEWS.

School Recommendations

No. 1980 (Student, Michigan) — "I have been interested in refrigeration and air conditioning for some time. Recently for the first time I saw a copy of your paper."

"Will you please send me a sample copy to read and also names of a few schools you recommend. Is the Herkimer Institute of New York a good school? Please advise."

Answer: Please refer to the Nov. 21 issue of ELECTRIC REFRIGERATION NEWS, on page 10 of which is an editorial setting forth the policy of the NEWS with respect to recommendations of schools.

'Certified Technicians'

No. 1981 (Service man, Florida) — "Would you kindly inform me of the names of the states that have laws which forbid any person from servicing electric refrigerators except a 'Certified Refrigeration Technician' or a certified man?"

Answer: So far as we know, there are no states which have laws forbidding any person from servicing electric refrigerators unless they are "certified technicians."

Some large cities have tried to set up ordinances establishing requirements for servicemen, but the only city of which we know where such an ordinance is in effect is Los Angeles.

Further information on this subject might be obtained by addressing Refrigeration Service Engineers Society, 435 N. Waller Ave., Chicago, Ill.

Sales This Year and Next

No. 1982 (Advertising Agency, Chicago) — "Will you please advise by wire collect what figure total refrigerator sales will probably reach this year. Also what sales figure authorities predict for next year."

Answer: Household electric refrigerator sales for 1934 will probably total about 1,400,000 units. President Howard E. Blood of Norge Corp. has predicted, on the basis of a consumer survey, that the 1935 sales volume will show an increase of at least 26 per cent above this year, with a possible maximum total of 2,200,000 units. Mr. Blood's predictions were published in a news story starting on page 1 of the Dec. 5 issue of ELECTRIC REFRIGERATION NEWS.

Ice Cream Formulas

No. 1982 (Dealer, Australia) — "Could you kindly give me a formula for the manufacture of ice cream powder and the name of any publication dealing

with the manufacture of special ice blocks, frozen desserts, and sweets."

Answer: Address Olsen Publishing Co., 503 W. Cherry St., Milwaukee, Wis., publisher of trade periodicals in the ice cream and dairy field, for the information desired.

Belding-Hall Data

No. 1983 (Advertising agency, New York) — "For several months I have been endeavoring to locate technical information regarding the Belding-Hall-Electrice refrigerator."

Answer: Service articles describing the operation of the Belding-Hall-Electrice refrigerator were published in the Aug. 22 and Aug. 29 issues of ELECTRIC REFRIGERATION NEWS.

Long Island Service Firms

No. 1984 (Advertising agency, New York) — "Could you furnish me with the name and address of service companies located in Long Island City, Astoria, Woodside, Jackson Heights, Elmhurst, Corona, Forest Hills or Flushing?"

Answer: Long Island City—Manhattan Movers, Inc., 2954 Northern Blvd.; P. J. Quinn, 166 Vernon Ave.; Refrigeration Motor Service, 3608 33rd St.

Woodside — Bennett's Refrigerating Service, 5013 59th Place.

Flushing — Flushing Refrigeration Co., 142-16 Roosevelt Ave. We have no service companies listed for the other communities you mention.

Industry's Sales Record

No. 1985 (Manufacturer, Michigan) — "For our branch managers convention, which is to be held in Detroit early in December, we are preparing comparisons of sales in various industries. We are in need of authoritative information for the preparation of data relative to the electric refrigeration industry, and have been referred to you for assistance. We shall certainly be most grateful to you if you can give us answers to the following questions:

"1. In what year was the electric refrigeration industry started, on a quantity production scale.
"2. What was the peak year in the industry since its inception, and what was the volume in dollars that year."

Answer: Our record of industry sales extends back as far as 1920. Up to and including the year 1920 it was estimated that approximately 10,000 household electric refrigerators had been sold. From the sales record in the 1934 REFRIGERATION DIRECTORY AND MARKET DATA BOOK you could probably determine when quantity production was begun by the industry.

The current year, 1934, is the record year with regard to sales of household electric refrigerators with an estimated 1,315,400 units being sold to distributors and dealers by industry manufacturers during the first 10 months. This figure is about 30 per cent ahead of the entire year 1933 when 1,080,700 units were sold, 1933 being the previous best year. Sales for the year 1934 will probably total better than 1,400,000 units.

To date we have not determined the average retail price or the total dollar volume of sales for this year, but dollar volume should approximate \$245,000,000. From the standpoint of dollar volume, the best year in industry history was 1931 when the figure was estimated at \$248,970,000 with unit sales recorded at 965,000.

Water Cooler Rental Firms

No. 1986 (Dealer, Illinois) — "Our company is engaged in the rental and sale of electric water coolers."

"We are anxious to know what other companies there are throughout the country engaged in a similar line of business. We would like a list of these companies either engaged exclusively in the rental and sale of electric water coolers, or else water companies throughout the country who have large interests in electric water coolers."

Answer: According to information obtained from the head of Kelvinator Corp.'s beverage cooling division, the R. L. Polk & Co., compiler of directories and mailing lists, has a list of more than 500 names of "water service" companies engaged in supplying cooled water for offices and commercial establishments.

Thermostatic Valve Article

No. 1987 (Importer, Belgium) — "We read on page 10 of your October 17 issue in the article 'Service Men' that you have published a study of the thermostatic expansion valve."

"Will you be kind enough to let us know in which issue this article appeared?"

Answer: An article by D. D. Wile of the Detroit Lubricator Co. dealing with thermostatic expansion valves was published in the April, 1933, issue of REFRIGERATED FOOD NEWS.

An article by Mr. Wile dealing with the application of thermostatic expansion valves to beer-cooling installations was published in the Oct. 25, 1933, issue of ELECTRIC REFRIGERATION NEWS. Mr. Wile also wrote an article on "Automatic Expansion Valves" which has been published in the Aug. 22, 1934, issue of the NEWS.

CLASSIFIED

RATES: Fifty words or less, one insertion \$2.00, additional words four cents each. Three insertions \$5.00, additional words ten cents each.

PAYMENT in advance is required for advertising in this column.

POSITIONS WANTED

WANTED: Position with distributor or manufacturer as wholesale representative. Six years' experience in wholesale distribution. Also experienced in commercial refrigeration and heat treating. Prefer South Eastern or South Central states, free to travel, references. Box 655.

FRANCHISE WANTED

MANUFACTURER'S REPRESENTATIVE contacting Michigan concerns is interested in new lines to sell especially to mechanical refrigerator makers. If you have something new to offer, let us help. We know the men to see and can get to them. In business over fifteen years. Commission basis only. Exclusive representation only. Box 654.

COMPANY FOR SALE

FOR SALE: Largest and best stocked refrigerator and radio sales and service company in Southwest. Authorized sales and service for several radio and refrigerator manufacturers. All stocks, equipment, delivery truck, fixtures, store lease, goodwill, reserves, sales and service contracts included. No indebtedness. Poor health selling reason. Box 653.

EQUIPMENT FOR SALE

USED 1/2 to 10 H.P. apartment multiple equipment for sale F.O.B. Chicago. For trade-in allowances by largest individual unit distributor. Examples: 2 H.P. Vilter, water cooled, methyl condensing unit complete with all controls—\$75.00. 1 1/2 H.P. Servel, counter-flow, water cooled with ice maker—\$65.00. L. H. Rykken, 3434 Nordica Ave., Chicago.

FLOAT VALVES REPAIRED

FLOAT VALVES, Frigidaires and Kelvinators, repaired and exchanged. All workmanship and service guaranteed. Trial order will convince you. Orders received will be shipped same day. Parcel or express. Price \$1.00 per float plus postage. Inwood Float Valve Exchange, 1 Seaman Ave., New York, N. Y.

INDEPENDENT SERVICE COMPANIES

HALELECTRIC thermostat repair service. B & B, G.E., Cutler-Hammer, Penn. Ranco, Tag, etc. Float valve needles reground and polished. Expansion valves repaired. Gas service. Ethyl, Methyl, Iso-Butane, Sulphur. Your cylinder or ours. Competitive prices. Distributors of "Flawless Brand" tubing. Halex Electric Laboratory, 1793 Lakeview Road, Cleveland, Ohio.

ALLELECTRIC—Rebuilding and supplies. All standard make compressor units, bodies, floats, motors, etc., rebuilt with genuine replacement parts. Our shop is equipped with modern machinery; we now reface old shafts, seals, etc., equal to new. Quick service—lowest prices—all labor and material guaranteed. Price list mailed to dealers on request. Allelectric Refrigeration Service Co., Inc., 451 East 163rd St., New York City.

PROFESSIONAL SERVICE

HAVE your patent work done by a specialist. I have had more than 25 years experience in refrigeration engineering. Prompt searches and reports. Reasonable fees. H. R. Van Deventer (ASRE), Patent Attorney, 342 Madison Avenue, New York City.

SCHOOLS

MEN: If you are mechanically inclined, have fair education, and can see the future in Refrigeration and Air Conditioning, we can train you in spare time. Small fee includes instruction, consultation, and Employment Service, also tools. Dr. O. F. Schoeck School of Refrigeration, Alton, Ill. EMPLOYERS: We can furnish trained men in your vicinity.

Extra Dry ESOTOO

LIQUID SULPHUR DIOXIDE

V-METH-L

METHYL CHLORIDE

VIRGINIA SMELTING Company

WEST NORFOLK, VA.

131 State St., Boston, and 76 Beaver St., New York

TEMPRITE

Instantaneous Cooling

"The leading cooler for water, beer and other beverages"

Write for Catalog

Temprite Products Corporation

(Formerly Liquid Cooler Corporation)

1349 Milwaukee East :: Detroit

EVERLASTINGLY—WE REPEAT

NO - SOLDERED - RETURN - BENDS

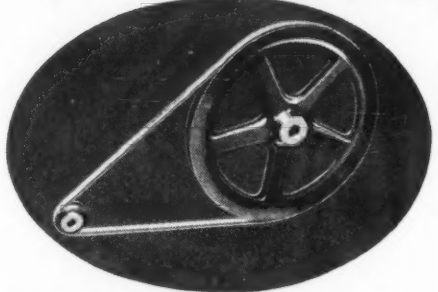
PEERLESS FIN COILS are made of CONTINUOUS tubing. Where there are NO joints there can be NO leaks, today—or ten years from today.

PEERLESS ICE MACHINE COMPANY

CHICAGO TWO FACTORIES NEW YORK
515 W. 35th ST. 43-00 36th ST. L.I.C.

DAYTON V-BELTS

There is a Dayton V-Belt made especially for all makes and types of refrigerators, washing machines and other appliances. A stock is available near you. Send for price list and name of your nearest distributor.



THE DAYTON RUBBER MFG. CO.
DAYTON, OHIO

The world's largest manufacturer of V-Belts

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The following special rates are for PAID-IN-ADVANCE subscriptions only in the United States and Possessions and Pan-American Postal Union Countries. Charge orders are billed at the single-subscription rate, regardless of number. Papers will be mailed to individual addresses.

	Electric Refrigeration News (weekly)	1935 Refrigeration Directory and Market Data Book (2 volumes)	Both Electric Refrigeration News and Refrigeration Directory
1 subscription	\$3.00	\$5.00	\$6.50
5 or more each	2.75	4.50	6.50
10 or more each	2.50	4.00	6.50
20 or more each	2.25	3.50	5.75
50 or more each	2.00	3.00	5.00
75 or more each	1.75	2.50	4.25
100 or more each	1.50	2.00	3.50

Electric Refrigeration News, 5229 Cass Ave., Detroit, Mich.

CRACKS
KOILS
KOOL

THE TRADEMARK OF FOUR

PACE SETTERS

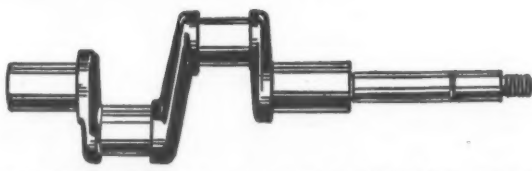
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SUR-E-FEX Fin Coils
FAN-E-FEX Diffusing Units
HUM-E-FEX Non-Dehydrating Coils
AIR-E-FEX Air-Conditioning Units

SEND FOR NEW CATALOG DESCRIBING THESE SENSATIONAL DEVELOPMENTS

REFRIGERATION APPLIANCES, INC.
H. J. KRACKOWIZER, Pres.
1342 WEST LAKE ST., CHICAGO

SHAFTS . . . Crank and Eccentric



for Compressors, made to YOUR Specifications.

Manufacturers—Send Blue Prints for Quotations.

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Specializing in the Manufacture of SHAFTS
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Liberal Discounts

340 N. Sacramento Blvd.

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Subscription Order

Business News Publishing Co.
5229 Cass Ave., Detroit, Mich. Date

☐ Enter my subscription to Electric Refrigeration News for one year (52 issues). U. S. and Possessions and all countries in the Pan-American Postal Union, \$3.00 per year. Canada, \$6.00 per year (due to special tariff). All other countries, \$5.00 per year (U. S. money).

☐ Enclosed find remittance. ☐ Send bill.

Name

Attention of In Care of

Street Address City and State

We sell the refrigerator and (Please indicate other products or principal line of business.)

12-12-34